**Mini System**

**FW-C38/21/21M/22/34/37**

**FW-C39/21/21M/30**

Service
Service
**Service**

# Service Manual

COMPACT disc DIGITAL AUDIO

## TABLE OF CONTENTS


| | Page |
|---|---|
| Location of pc boards & Version variations | 1-2 |
| Technical Specifications | 1-3 |
| Measurement setup | 1-4 |
| Service Aids, Safety Instruction, etc. | 1-5 |
| Instruction for use: Overseas version excerpt | 2-1 |
| Additional features | 2-10 |
| Disassembly Instructions & Service positions | 3-1 |
| Service Test Programs | 3-4 |
| Set Block diagram | 4 |
| Set Wiring diagram | 5 |
| Front Board | 6 |
| Tuner Board: ECO5 Sys | 7B |
| Tuner 95 | 7D |
| ETF7 Tape Module | 9 |
| 3CDC-99 Module | 10 |
| Combi Board | 11 |
| Set Mechanical Exploded view & parts list | 12 |


**CLASS 1**
**LASER PRODUCT**


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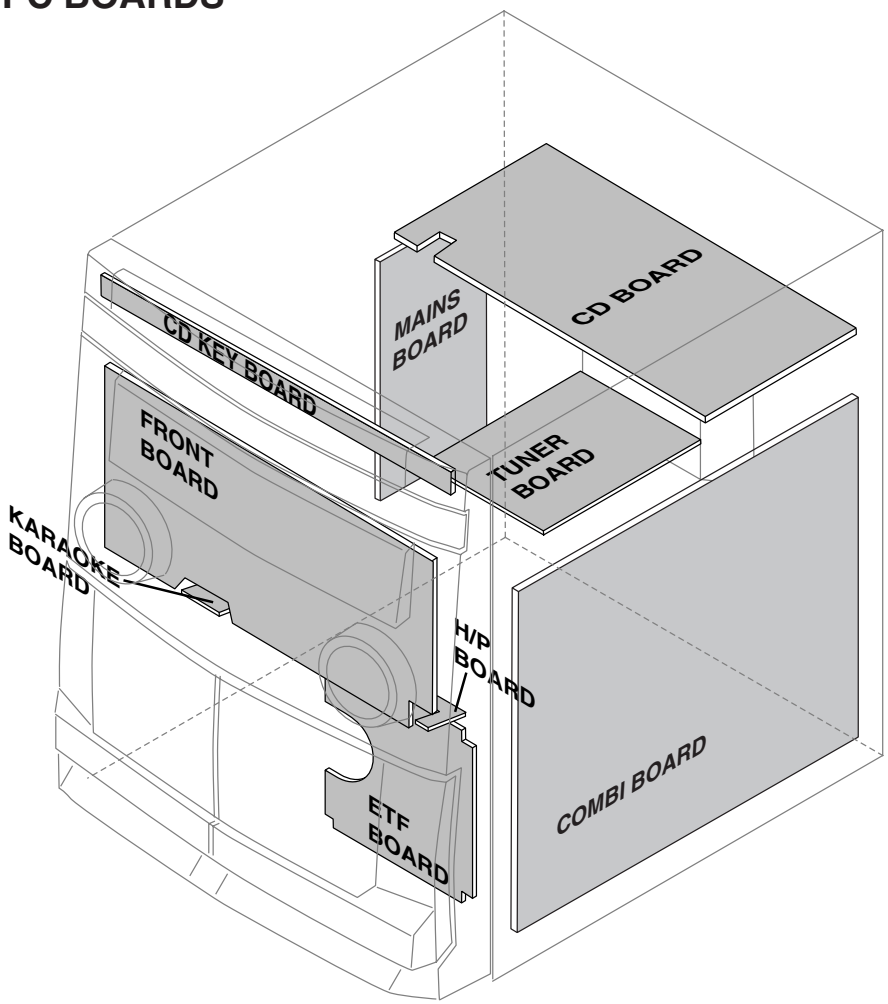
PHILIPS

# LOCATION OF PC BOARDS




**VERSION VARIATIONS:**

| Type /Versions: / Features & Board in used: | FW-C38 | | | | | FW-C39 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | /21 | /21M | /22 | /34 | /37 | /21 | /21M | /30 | /33 |
| Dolby B | | | | | | | | | |
| Incredible Surround | x | x | x | x | x | x | x | x | x |
| Karaoke | x | x | | | | x | x | | x |
| News | | | x | x | | | | | |
| RDS | | | x | x | | | | | |
| Rotary Encoder (volume control) | x | x | x | x | x | x | x | x | x |
| Jog Shuttle | x | x | x | x | x | x | x | x | x |
| Voltage Selector | x | x | | | | x | x | | |
| Aux Input | x | x | x | x | x | x | x | x | x |
| Digital Output | x | x | x | x | x | x | x | x | x |
| Headphone Socket | x | x | x | x | x | x | x | x | x |
| Line Output | | | | | | | | | |
| Subwoofer Output | x | x | x | x | x | x | x | x | x |
| Surround Output | | | | | | | | | |
| Matrix Surround Loudspeakers | | | | | | x | x | x | x |
| Tuner board - ECO5 Sys | x | x | | x | x | x | x | x | x |
| Tuner board - Tuner 95 | | | x | | | | | | |
| Standby with clock display | x | x | x | x | x | x | x | x | x |

## SPECIFICATIONS

### GENERAL:

Mains voltage : 110-127V/220-240V Switchable for /21/21M
120V for /37
220V for /33
220-230V for /22/34
230V for /25
230-240V for /30

Mains frequency : 50/60Hz
Power consumption Standby : < 25W
Active : < 75W
Clock accuracy : < 4 seconds per day
Dimension centre unit : 265 x 310 x 340mm

### TUNER:

**FM**

Tuning range : 87.5-108MHz
65.81-74MHz for /34 [1)]
Grid : 50kHz (& 30kHz for /34)
100kHz for /37
IF frequency : 10.7MHz ± 25kHz
Aerial input : 75ohm coaxial
300ohm click fit for /37
Sensitivity at 26dB S/N : < 7µV
Selectivity at 600kHz bandwidth : > 25dB [> 30dB]
Image rejection : > 25dB [> 60dB]
Distortion at RF=1mV, dev. 75kHz : < 3%
-3dB Limiting point : < 8µV
Crosstalk at RF=1mV, dev. 40kHz : > 18dB

**MW**

Tuning range : 531-1602kHz
530-1700kHz for /21/37
Grid : 9kHz
10kHz for /21/37
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : < 4.0mV/M
Selectivity at 18kHz bandwidth : > 18dB
IF rejection : > 45dB [> 40dB]
Image rejection : > 28dB
Distortion at RF=50mV, m=80% : < 5%

**LW**

Tuning range : 153-279kHz
Grid : 3kHz
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : [< 7.0mV/M]
Selectivity at 18kHz bandwidth : [> 30dB]
IF rejection : [> 25dB]
Image rejection : [> 35dB]
Distortion at RF=50mV, m=80% : [< 5%]

### AMPLIFIER:

Output power
Left/Right : 2 x 25W FTC [3)] @ 6 ohm
2 x25W RMS [2)] @ 6 ohm /37
Surround : 2 x 5W [4)] @ 6 ohm
Frequency response within ±3dB : 50Hz-15kHz
Dynamic Bass Boost : DBB On, DBB Off [5)]
Digital Sound Control : Jazz, Techno, Optimal, Rock [5)]
Incredible Surround : Inc Surr, IS Off [5)]
VEC Control : Hall, Cinema, Concert [5)]
Input sensitivity
Aux-in : 700mV ± 3dB at 600ohm
Mic : {3.5mV ± 3dB} at 600ohm
Output sensitivity
Sub-woofer : 1.5V ± 3dB at 22kohm
Headphone : 18mW at 32ohm
Digital Out : 44.1kHz IEC958

### CASSETTE RECORDER:

Number of track : 2 x 2 stereo
Tape speed : 4.76 cm/sec ± 2%
Wow and flutter : < 0.4% DIN
Fast-wind/rewind time C60 : 130 sec
Bias system : 75kHz ± 10kHz
Rec/Pb frequency response within 8dB : 80Hz - 12.5kHz
Signal to noise ratio Type I : > 48dBA
Type II : > 52dBA

### COMPACT DISC:

Measurement done at output conn. of the CDC module.
Frequency response within ± 1.5dB : 20Hz - 20kHz
Output level (in Vrms) : 550mV ± 2dB unloaded
Signal/Noise ratio (A-weighted) : > 80dBA
Distortion at 1kHz : < 0.003%
Channel difference at 1kHz : < ± 1dB
Channel separation at 1kHz : > 60dB
De-emphasis : 0 or 15/50 mS (Switched by subcode on the disc)

[....] Values indicated are for "Tuner 95 Board" only

{....} Values indicated are for Karaoke version only

[1)] Default setting is OFF, to switch on please refer to page 3-4

[2)] ±1dB, 60Hz - 12,5kHz, 10% THD

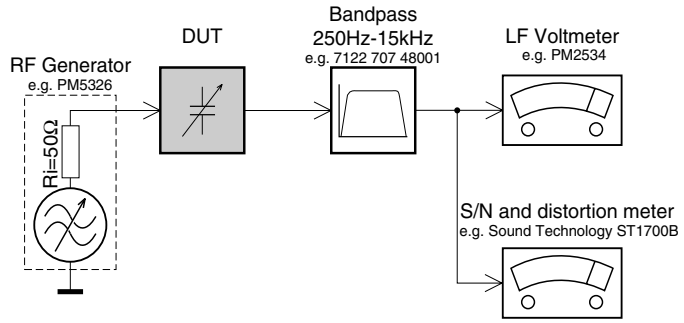
[3)] ±1dB, 1kHz, 10% THD

[4)] For FW-C39 only

[5)] Frequency response in each setting is software controlled.

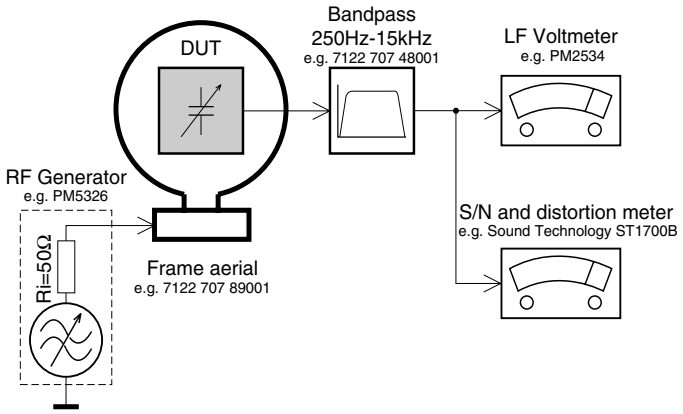
# MEASUREMENT SETUP

### *Tuner FM*




Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilottone (19kHz, 38kHz).

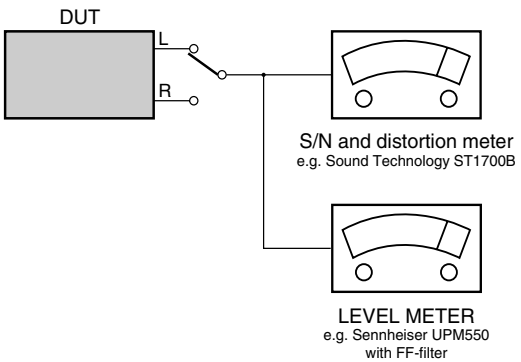
### *Tuner AM (MW,LW)*




To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday´s cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

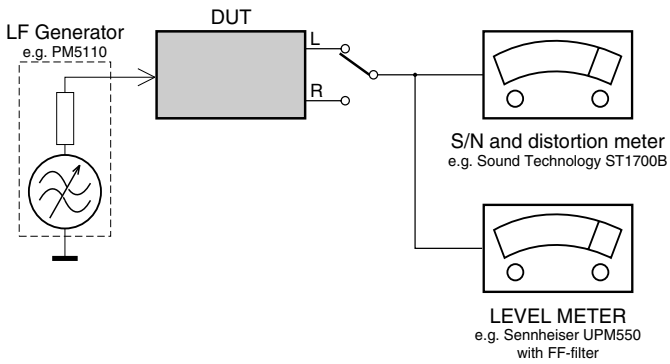
### *CD*

Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)




### *Recorder*

Use Universal Test Cassette **CrO2** SBC419 4822 397 30069
or Universal Test Cassette **Fe** SBC420 4822 397 30071



# SERVICE AIDS

**Service Tools:**

Universal Torx driver holder ..... 4822 395 91019
Torx bit T10 150mm ..... 4822 395 50456
Torx driver set T6 - T20 ..... 4822 395 50145
Torx driver T10 extended ..... 4822 395 50423

**Cassette:**

SBC419 Test cassette CrO2 ..... 4822 397 30069
SBC420 Test cassette Fe ..... 4822 397 30071
MTT150 Dolby level 200nWb/M ..... 4822 397 30271

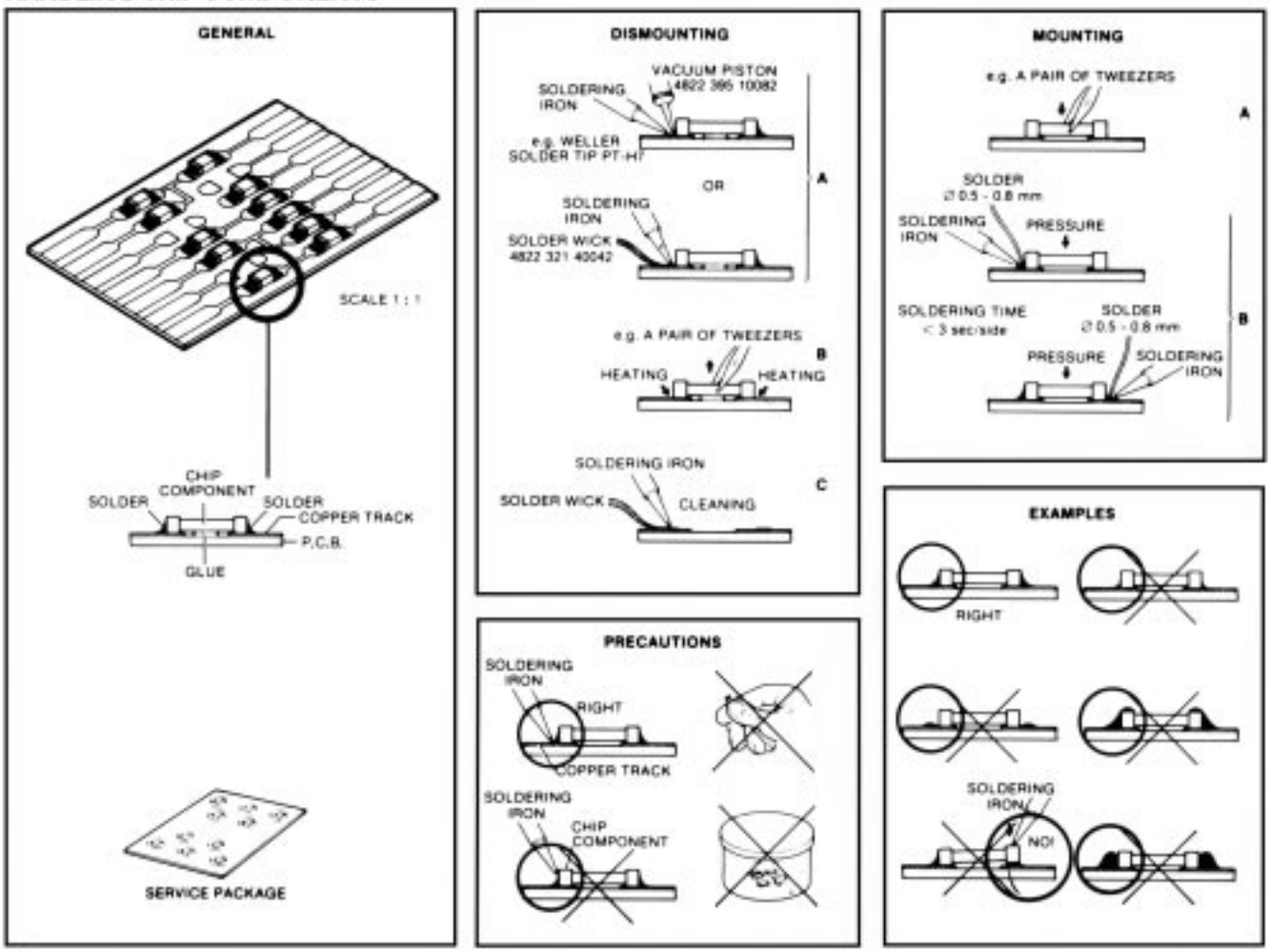
**Compact Disc:**

SBC426/426A Test disc 5 + 5A ..... 4822 397 30096
SBC442 Audio Burn-in Test disc 1kHz ..... 4822 397 30155
SBC429 Audio Signals disc ..... 4822 397 30184
Dolby Pro-logic Test Disc ..... 4822 395 10216

**ESD Equipment:**

Anti-static table mat - large 1200x650x1.25mm ... 4822 466 10953
Anti-static table mat - small 600x650x1.25mm ..... 4822 466 10958
Anti-static wristband ..... 4822 395 10223
Connector box (1MΩ) ..... 4822 320 11307
Extension cable
(to connect wristband to conn. box) ..... 4822 320 11305
Connecting cable
(to connect table mat to conn. box) ..... 4822 320 11306
Earth cable (to connect product to mat or box) .... 4822 320 11308
Complete kit ESD3
(combining all above products) ..... 4822 320 10671
Wristband tester ..... 4822 344 13999

## HANDLING CHIP COMPONENTS



# ESD

**GB WARNING**

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools also at this potential.

**F ATTENTION**

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

**D WARNUNG**

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

**NL WAARSCHUWING**

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

**I AVVERTIMENTO**

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

**GB**

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used.

**NL**

Veiligheidsbepalingen vereisen, dat het apparaat bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

**F**

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utiliséés les piéces de rechange identiques à celles spécifiées.

**D**

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Original zustand des Geräts darf nicht verändert werden; für Reparaturen sind Original-Ersatzteile zu verwenden.

**I**

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

"After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist. The leakage current must not exceed 0.5mA."

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

**GB Warning !**

Invisible laser radiation when open.
Avoid direct exposure to beam.

**S Varning !**

Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

**SF Varoitus !**

Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

**DK Advarse !**

Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

## CONTENTS


*General Information ..... 5*
*Safety Information ..... 5*
*Preparation ..... 6 - 7*
*Controls ..... 8 - 9*
*Operating The System .... 10 - 12*
*CD ..... 12 - 15*
*Tuner ..... 16 - 17*
*Tape ..... 17- 18*
*AUX ..... 18*
*Karaoke ..... 18*
*Recording ..... 19 - 20*
*Clock ..... 20*
*Timer ..... 21*
*Sleep Timer ..... 21*
*Specifications ..... 22*
*Maintenance ..... 23*
*Troubleshooting ..... 23 - 24*


## GENERAL INFORMATION

**IMPORTANT:**
**PLEASE NOTE THAT THE VOLTAGE SELECTOR LOCATED AT THE REAR OF THIS SYSTEM IS PRESET AT 220V FROM THE FACTORY. FOR COUNTRIES THAT OPERATE AT 110V, PLEASE ADJUST TO 110V BEFORE YOU SWITCH ON THE SYSTEM.**

### General Information

- ***The type plate (which contains the serial number) is located at the rear of the system.***
- ***Recording is permissible if copyright or other rights of third parties are not infringed.***

### Environmental Information

All unnecessary packaging has been omitted. We have tried to make the packaging easy to separate into three materials: cardboard (box), polystyrene foam (buffer) and polyethylene (bags, protective foam sheet).

Your system consists of materials which can be recycled and reused if disassembled by a specialized company. Please observe the local regulations regarding the disposal of packaging materials, exhausted batteries and old equipment.

## SAFETY INFORMATION

### Accessories *(Supplied)*

– Remote control
– Batteries (two AA size) for remote control
– AM loop antenna
– FM wire antenna
– AC power cord
– SS-39 Surround Speakers *(for model FW-C39 only)*

### Safety Information

- Before operating the system, check that the operating voltage indicated on the typeplate (or the voltage indication beside the voltage selector) of your system is identical with the voltage of your local power supply. If not, please consult your dealer. The typeplate is located at the rear of your system.
- When the system is switched on, do not move it around.
- Place the system on a solid base (e.g. a cabinet).
- Place the system in a location with adequate ventilation to prevent internal heat build-up in your system. Allow at least 10cm clearance from the rear and the top of the unit and 5cm from each side.
- Do not expose the system to excessive moisture, rain, sand or heat sources.
- Under no circumstances should you repair the system yourself, as this will invalidate the warranty!
- If the system is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lens of the CD unit inside the system. Should this occur, the CD player will not operate normally. Leave the power on for about one hour with no disc in the system until normal playback is possible.
- Electrostatic discharge may cause unexpected problems. See whether these problems disappear if you unplug the AC power cord and plug it in again after a few seconds.
- **To disconnect the system from the power supply completely, remove the AC power plug from the wall socket.**

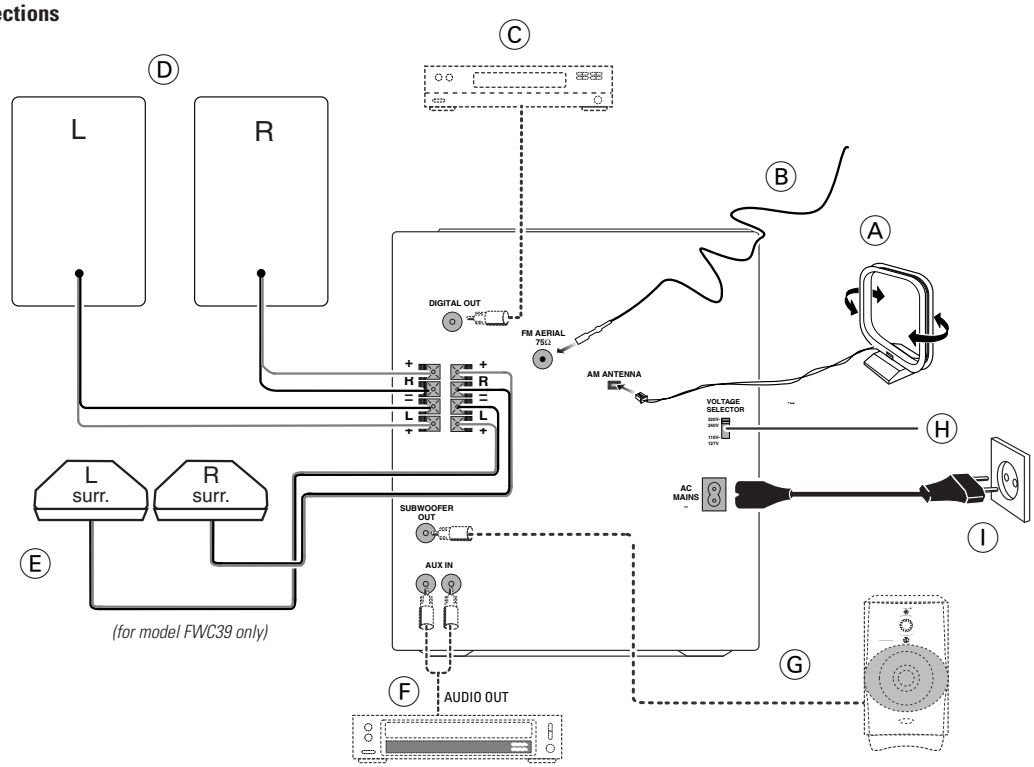
English



## PREPARATION

English

### Rear Connections



### Ⓐ AM Loop Antenna Connection

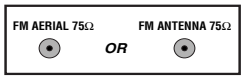
Connect the supplied loop antenna to the AM ANTENNA terminal. Place the AM loop antenna far away from the system and adjust its position for the best reception.

### Ⓑ FM Wire Antenna Connection

Connect the supplied FM wire antenna to the FM AERIAL (FM ANTENNA) 75 Ω terminal. Adjust the position of the FM antenna for the best reception.

**Outdoor Antenna**

For better FM stereo reception, connect an outdoor FM antenna to the FM AERIAL (FM ANTENNA) 75 Ω terminal using a 75 Ω coaxial wire.



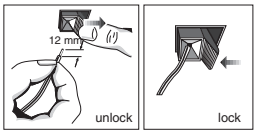

### Ⓒ Digital Out Connection

You can record the digital sound from the CD, through this output, on any audio equipment with digital input (e.g. CD Recorder, Digital Audio Tape (DAT) deck, Digital to Analog Converter and Digital Signal Processor).

Connect one end of the cinch cable (not supplied) to the DIGITAL OUT socket and the other end to the audio equipment with digital input.When connecting the cinch cable, make sure it is fully inserted.

### Ⓓ Speakers Connection

- Connect the right speaker to Front terminal R, with the colored wire to + and the black wire to −.
- Connect the left speaker to Front terminal L, with the colored wire to + and the black wire to −.
- Clip the stripped portion of the speaker wire as shown.




### Ⓔ Rear Surround Speakers' Connection *(for models FW-C39 only)*

Connect the black (non-marked) wires to the black REAR SURROUND terminals and the colored (marked) wires to the grey REAR SURROUND terminals.

### Ⓕ Connecting other equipment to your system

You can connect the audio left and right OUT terminals of a TV, VCR, Laser Disc player, DVD player or CD Recorder to the AUX IN terminals at the rear of the system.

### Ⓖ Subwoofer Out Connection

Connect the optional active subwoofer to the SUBWOOFER OUT terminal. The subwoofer reproduces just the low bass sound effect (e.g. explosions, the rumble of spaceships, etc.). Be sure to follow the instructions supplied with the subwoofer.

### Ⓗ Adjusting the Operating Voltage

*(not available for version /30)*

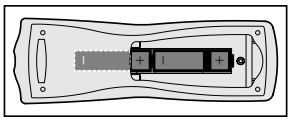
Before connecting the AC power cord to the wall outlet, make sure that the voltage selector at the rear of the system is set to the local power line voltage. If not, reset the selector before connecting to the wall outlet.

### Ⓘ AC Power Supply

After all other connections have been made, connect the AC power cord to the system and to the wall outlet.

### Inserting batteries into the Remote Control

- Insert the batteries (Type R06 or AA) into the remote control as shown in the battery compartment.



- To avoid damage from possible battery leakage, remove dead batteries or batteries that will not be used for a long time. For replacement, use type R06 or AA batteries.

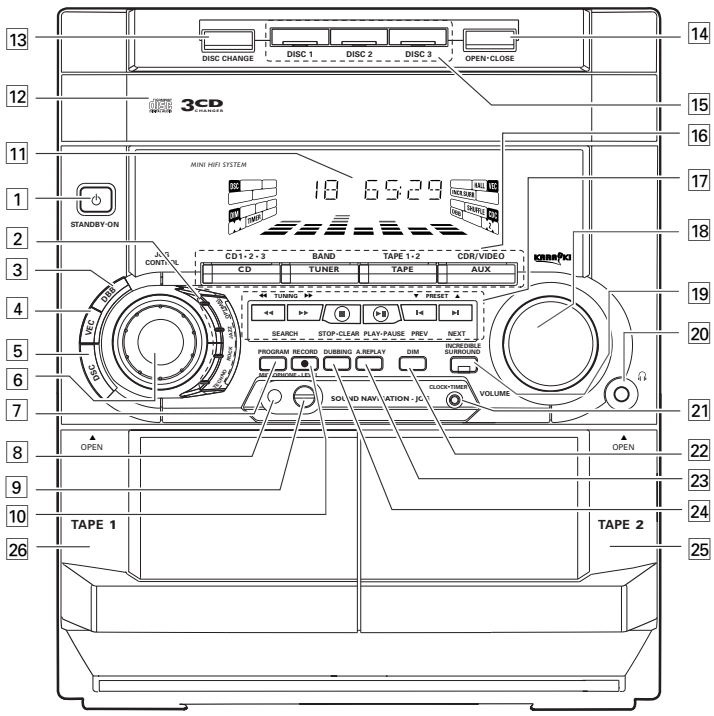
***Notes for remote control:***

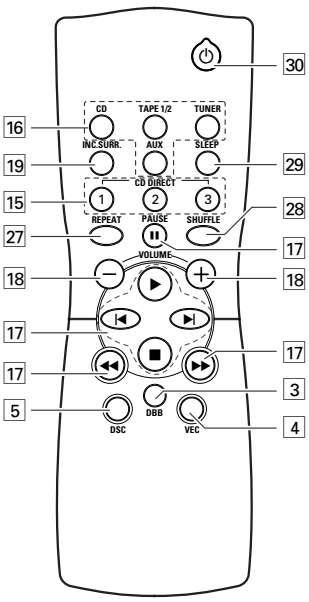
- ***First select the source you wish to control by pressing one of the source select keys on the remote control (e.g. CD ,TUNER, etc.).***
- ***Then select the desired function ( ▶, I◀, ▶I, etc.).***









## Controls on the system and remote control

1 **STANDBY ON**
– to switch the system on or to standby mode.
– to use for EASY SET.

2 **DIGITAL SOUND CONTROL DISPLAY PANEL**
– to view the desired DSC display.

3 **DBB (DYNAMIC BASS BOOST)**
– to switch on bass boost, to enhance bass response or to switch off bass boost.

4 **VEC**
– to select the desired Virtual Environment Control effect : HALL, CINEMA or CONCERT.

5 **DSC**
– to select the desired sound effect : OPTIMAL, JAZZ, ROCK or TECHNO.

6 **JOG CONTROL**
– to select the desired DSC setting. You must select the DSC feature first.
– to select the desired VEC setting. You must select the VEC feature first.

7 **PROGRAM**
for CD ..... to program CD tracks.
for TUNER ..... to program preset radio stations.
for CLOCK ..... to select 12- or 24-hour in clock setting mode.

8 **MICROPHONE** *(not available for version /30)*
– to connect microphones jack.

9 **MIC LEVEL** *(not available for version /30)*
– to adjust the mixing level for karaoke or microphone recording.

10 **RECORD**
– to start recording on tape deck 2 only.

11 **DISPLAY SCREEN**
– to view the current setting of the system.

12 **CD CAROUSEL TRAY**

13 **DISC CHANGE**
– to change CD(s).

14 **OPEN•CLOSE**
– to open or close the CD carousel tray.

15 **DISC 1 / DISC 2 / DISC 3 (CD DIRECT PLAY)**
– to select a CD tray for playback.

16 **SOURCE** – to select the following:
**CD / (CD 1•2•3)**
– to select CD mode. When CD playback is stopped, press to select disc tray 1, 2 or 3.
**TUNER / (BAND)**
– to select Tuner mode. When in tuner mode, press to select the waveband: FM or MW.
**TAPE / (TAPE 1• 2)**
– to select Tape mode. When tape playback is stopped, press to select either tape deck 1 or 2.
**AUX (CDR/VIDEO)**
– to select sound from an external source (e.g. TV, VCR, Laser Disc player, DVD player or CD Recorder).

17 **MODE SELECTION**
**SEARCH ◀◀ ▶▶ (TUNING ◀◀▶▶)**
for CD ..... to search backward/forward.
for TUNER ..... to tune to a lower or higher radio frequency.
for TAPE ..... to rewind or fast forward on tape.
for CLOCK ..... to set the hour *(on the system only)*.
**STOP•CLEAR ■**
for CD ..... to stop CD playback or to clear a program.
for TUNER ..... to stop programming.
for TAPE ..... to stop playback or recording.
for DEMO ..... *(on the system only)* to start or stop demonstration mode.
**PLAY ▶ / PAUSE ❚❚**
for CD ..... to start or interrupt playback.
for TAPE ..... to start playback.
**PREV ⏮ / NEXT ⏭(PRESET ▼▲ )**
for CD ..... to skip to the beginning of the current, previous, or next track.
for TUNER ..... to select a preset station in memory.
for CLOCK ..... to set the minute *(on the system only)*.

18 **VOLUME**
– to increase or decrease the volume.

19 **INCREDIBLE SURROUND**
– to switch on or off the surround sound effect.

20 🎧
– to connect headphones.

21 **CLOCK•TIMER**
– to view the clock, set the clock or set the timer.

22 **DIM**
– to select different brightness for the display screen : DIM 1, DIM 2, DIM 3 or DIM OFF.

23 **AUTO REPLAY**
– to select playback mode either in continuous AUTO REPLAY or ONCE only.

24 **DUBBING**
– to dub a tape in normal speed.

25 **TAPE DECK 2**

26 **TAPE DECK 1**

27 **REPEAT**
– to repeat a CD track, a disc, or all available discs.

28 **SHUFFLE**
– to play all the available discs and their tracks in random order.

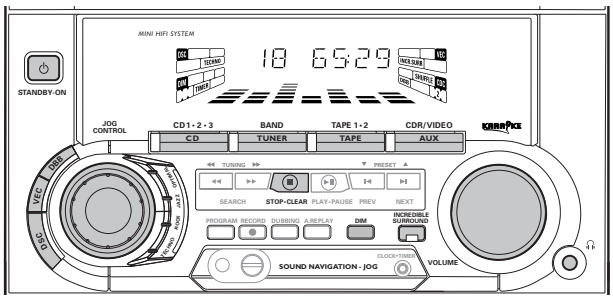
29 **SLEEP**
– to switch the system to standby mode at a selected time.

30 ⏻
– to switch the system to standby mode.



## OPERATING THE SYSTEM






***Important:***
***Before you operate the system, complete the preparation procedures.***

### Demonstration mode

The system has a demonstration mode that shows the various features offered by the system. ***When the system is switched on for the first time, the demonstration mode will start automatically.***

*Notes:*
– *During the demonstration, if you press any source (or standby-on) button, the system will switch to the respective mode (or standby).*
– *When the system is switched to standby mode, the demonstration will resume 5 seconds later.*

**To stop the demonstration mode**
- Press and hold ■ *(on the system only)* for ***5 seconds*** when the system is in demonstration mode.
  → The demonstration will stop.
  → "DEMO OFF" is displayed.
  → The system will switch to standby mode.

*Note:*
– *Even though the AC power cord is removed from and reconnected to the wall socket, the demonstration will remain off until it is switched on again.*

**To start the demonstration mode**
- Press and hold ■ *(on the system only)* for ***5 seconds*** when the system is in standby mode.
  → The demonstration will begin.

### Easy Set

EASY SET allows you to store all available radio stations automatically.

- Press and hold **STANDBY ON** *(on the system only)* for ***5 seconds*** when the system is in standby or demonstration mode.
  → "EASY SET" will be displayed, and followed by "TUNER" and then "AUTO".
  → EASY SET will start searching for all radio on FM band and then followed by radio stations on MW band.
  → All available radio stations with sufficient signal strength will be stored. Up to 40 presets may be stored.

*Notes:*
– *EASY SET will start with the FM band, if there are still presets available, the system will continue to store the MW band.*
– *When EASY SET is used, all previously stored radio stations will be replaced.*
– *The last preset radio station will appear on the display when EASY SET is completed.*

### Switching the system ON

- Press **CD, TUNER, TAPE** or **AUX**.

You can also switch on the system by pressing any one of the CD DIRECT PLAY buttons.

### Switching the system to standby mode

- Press **STANDBY ON** or ⏻ on the remote control.
  → The system will switch to standby mode.

### Selecting the Source

- Press the respective source selection button: **CD, TUNER, TAPE** or **AUX**.
  → The display indicates the selected source.

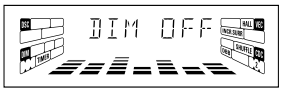
*Note:*
– *For an external source, make sure you have connected the audio left and right OUT terminals of the external equipment (TV, VCR, Laser Disc player, DVD player or CD Recorder) to the AUX IN terminals.*

## DIM mode

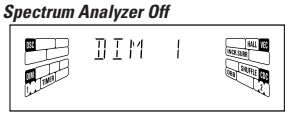
You can select the desired brightness for the display.

- Press **DIM** to select DIM 1, DIM 2, DIM 3 or DIM OFF display mode.
  → The **DIM** appear on the display.
  → "DIM 1", "DIM 2", "DIM 3" or "DIM OFF" will be displayed depending on the mode selected.

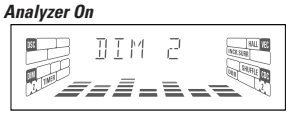
***DIM OFF - normal brightness with Spectrum Analyzer On***



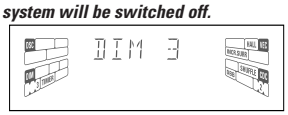

***DIM 1 - normal brightness with Spectrum Analyzer Off***




***DIM 2 - half brightness with Spectrum Analyzer On***




***DIM 3 - half brightness with Spectrum Analyzer Off and all LEDs on the system will be switched off.***




## Sound Control

***VOLUME ADJUSTMENT***

Adjust **VOLUME** to increase or decrease the sound level.

*For Personal Listening*

Connect the headphones plug to the 🎧 socket at the front of the system. The speakers will be muted.

***DIGITAL SOUND CONTROL (DSC)***

The DSC feature enables you to enjoy special sound effects that have preset equalizer settings, providing the best music reproduction.

1 Press to select the **DSC** feature.
2 Adjust **JOG CONTROL** to select OPTIMAL, JAZZ, ROCK or TECHNO.
  → The Digital Sound Control display panel will light up respectively.
  → "OPTIMAL, JAZZ, ROCK or TECHNO" and the respective flag will be displayed.

*Note:*

– *When "OPTIMAL" sound is selected, DBB will be switched on automatically.*

***DYNAMIC BASS BOOST (DBB)***

The DBB mode enhances the bass response.

- Press **DBB** to switch on bass response.
  → The DBB button lights up.
  → "DBB ON" and the **DBB** flag will be displayed.

**To switch off DBB**

- Press **DBB** again.
  → The DBB button light is switched off.
  → "DBB OFF" will be displayed.
  → The **DBB** flag disappear from the display.

*Note:*

– *Some CDs or tapes might be recorded in high modulation, which causes a distortion at high volume. If this occurs, switch off DBB or reduce the volume.*

***VIRTUAL ENVIRONMENT CONTROL (VEC)***

The VEC feature enables you to adjust the system to select a type of environment.

1 Press to select the **VEC** feature.
2 Adjust the **JOG CONTROL** to select the desired Virtual Environment Control setting : HALL, CINEMA or CONCERT.
  → "HALL, CINEMA or CONCERT" and the respective flag will be displayed.

| VEC Selection | DBB | IS |
|---|---|---|
| HALL | On | On |
| CONCERT | Off | On |
| CINEMA | Off | On |







***Incredible Surround***

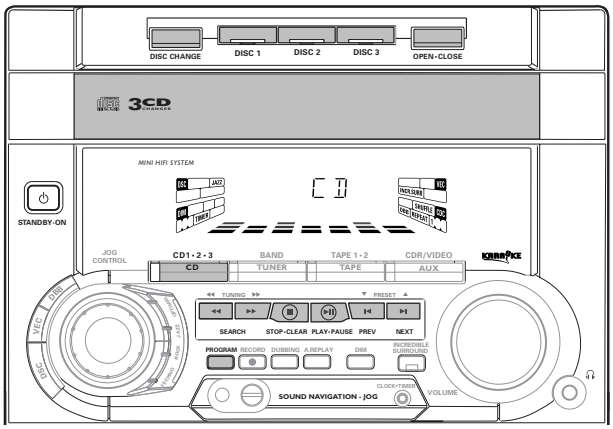
Normal stereo sound is determined by the distance between the front speakers. When Incredible Surround is switched on, it magnifies the virtual distance between the front speakers for an incredibly wide, enveloping, stereo effect.

- Press **INCREDIBLE SURROUND** to switch on.
  → The INCREDIBLE SURROUND button lights up.
  → "INC SURR" and the INCR. SURR flag will be displayed.

**To switch off Incredible Surround**

- Press **INCREDIBLE SURROUND** again.
  → The INCREDIBLE SURROUND button light is switched off.
  → "IS OFF" will be displayed.
  → The INCR. SURR flag disappear from the display.

## CD




***Warning!***

***1) This system is designed for conventional CDs. Do not use any accessories such as disc stabilizer rings or CD treatment sheets, etc., which may damage the CD mechanism.***
***2) Do not load more than one disc into each tray.***
***3) When the CD changer is loaded with CDs, do not turn over or shake the system. This may jam the changer.***

**You may load three discs in the CD changer for continuous playback without interruption.**

## Discs for playback

This system can play all digital audio CD, finalized digital audio CD-Recordable and finalized digital audio CD-Rewritable format discs.

## Loading the CD Changer

**1** Press **CD** to select CD mode.
**2** Press **OPEN•CLOSE**.
→ The CD carousel tray slides out.
**3** Load a CD with the printed side up in the right tray.
• You can load another disc in the left tray.
• To load the third disc, press the **DISC CHANGE** button.
→ The CD carousel tray will rotate until the empty tray is ready for loading.
**4** Press **OPEN•CLOSE** to close the CD carousel tray.
→ The total number of tracks and the playing time of the selected disc appear on the display.

*Note:*
– *To ensure good system performance, wait until the CD changer completely reads the disc(s) before proceeding.*

## CD Direct Play

• You can play a CD directly by pressing the **DISC 1**, **DISC 2** or **DISC 3** button. The CD player will stop at the end of playback of the selected disc.
→ A lit button indicates that a disc is loaded in the disc tray.
→ A flashing button indicates that a disc is playing.

## Playing a CD

**1** Press ▶ to start playback.
→ The disc tray, track number and elapsed playing time of the current track appear on the display.
• To interrupt playback, press ❚❚.
→ The playing time flashes.
• To resume playback, press ▶ again.
**2** To stop playback, press ■.

*Note:*
– *All the available discs will play once, then stop.*

## Disc Change

You can change the outer two discs while the third inner disc is stopped or is playing.

**1** Press **DISC CHANGE**.
→ The CD carousel tray slides out.
**2** Replace the discs in the left and right disc trays.
• If you press **DISC CHANGE** again during playback, the CD will stop playing.
→ The CD carousel tray will rotate until the inner tray is rotated out and is ready for changing.
**3** Press **OPEN•CLOSE** to close the CD carousel tray.

## Selecting a desired track

**Selecting a desired track when playback is stopped**

**1** Press ⏮ or ⏭ until the desired track appears on the display.
**2** Press ▶ to start playback.
→ The selected track number and elapsed playing time appear on the display.

**Selecting a desired track during playback**

• Press ⏮ or ⏭ until the desired track appears on the display.
→ The selected track number and elapsed playing time appear on the display.
• If you press ⏮ once it will skip to the beginning of the current track and play the track again.

*Note:*
– *Pressing ⏮ during shuffling can only skip to the beginning of the current track.*

## Searching for a particular passage during playback

• Press and hold ◀◀ or ▶▶ until the desired passage is located.
→ The volume will be reduced.
• Play returns to normal when ◀◀ or ▶▶ is released.







## Programming Tracks

Programming tracks of a loaded CD is possible when playback is stopped. The display will indicate the total tracks stored in the program. Up to 40 tracks can be stored in the memory in any order. When 40 tracks are stored and you attempt to store another track, the display will show "PROGRAM FULL".

**1** Load the desired discs in the disc trays.
**2** Press **PROGRAM** to start programming.
→ The PROG flag starts flashing.
→ It will cancel any previously selected repeat mode.
**3** Press the **CD** (CD 1•2•3) or **DISC 1/2/3** button to select the disc.
**4** Press ⏮ or ⏭ to select the desired track.
**5** Press **PROGRAM** to store the track.
• Repeat steps ***3*** to ***5*** to store other discs and tracks.
**6** Press ■ once to end programming.
→ The total number of tracks programmed and total playing time appear on the display.

*Notes:*
– *If the total playing time is more than "99:59" or if one of the programmed tracks has a number greater than 30, then "--:--" appears on the display instead of the total playing time.*
– *If the system is reading the discs, programming is not possible, "READING" will be displayed and followed by "DISC X". "X" is the current read disc number.*
– *During programming, if no button is pressed within 20 seconds, the system will exit program mode automatically.*

## Reviewing the program

Reviewing of the program is possible only when playback is stopped.

• Press ⏮ or ⏭ repeatedly to review the programmed tracks.
• Press ■ to exit review mode.

## Playing the program

**1** Press ▶ to start program playback.
→ "PLAY PROGRAM" will be displayed.
→ The track number and elapsed playing time of the current track will appear on the display.
• If you press **REPEAT** during program playback, the current track or all programmed tracks will be played repeatedly.
→ "TRACK" or "PROGRAM" will be displayed.
→ The REPEAT and PROG flags appear on the display.
**2** Press ■ to stop program playback.

*Notes:*
– *If you press any of the CD DIRECT PLAY buttons, the system will play the selected disc or track and the stored program will be ignored temporarily. The **PROG** display also will disappear temporarily from the display. It will reappear when playback of the selected disc ends.*
– *REPEAT DISC mode will be cancelled when program playback begins.*

## Erasing the program *(when playback is stopped)*

• Press ■.
→ "PROGRAM CLEARED" will be displayed.

*Note:*
– *The program will be erased when the system is disconnected from the power supply or when the CD carousel tray is opened.*

## Shuffle *(only on remote control)*

In shuffle mode, the system plays all the available discs and their tracks in random order. Shuffle may be used also when tracks are programmed.

**To shuffle all the discs and tracks**

**1** Press **SHUFFLE**.
→ "SHUFFLE" will be displayed.
→ The SHUFFLE flag, the disc and the track selected at random appear on the display.
• The discs and the tracks will be played in random order until you press ■.
• If you press **REPEAT** during shuffling, the current track or all available discs will be played repeatedly.
→ "TRACK" or "ALL DISC" will be displayed.
→ The REPEAT and SHUFFLE flags appear on the display.
**2** Press **SHUFFLE** again to resume normal playback.
→ The SHUFFLE flag disappears from the display.

*Note:*
– *REPEAT DISC mode will be cancelled when shuffle is selected.*

## CD

### Repeat *(only on remote control)*

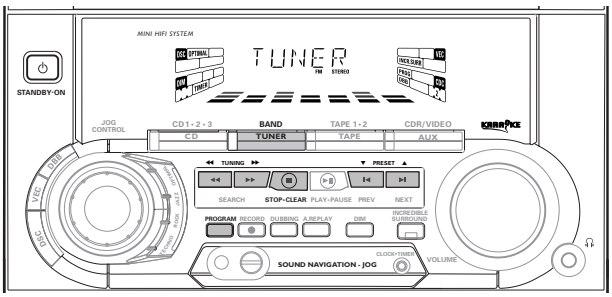
You can play the current track, a disc or all available discs repeatedly.

**1** Press **REPEAT** on the remote control to select the various repeat modes.
→ "TRACK", "DISC", "ALL DISC" or "OFF" will be displayed.
→ The REPEAT flag appears on the display.
- The selected track, selected disc or all available discs will now be played repeatedly until you press ■ .

**2** Press **REPEAT** until the "OFF" mode is displayed to resume normal playback.
→ The REPEAT flag disappears from the display.

*Notes:*
– *REPEAT DISC mode is not available during program play or shuffle mode.*
– *You can also repeat shuffling a program.*
→ "TRACK" or "PROGRAM" will be displayed.
→ *The **REPEAT**, **PROG**, and **SHUFFLE** flags appear on the display.*

## TUNER




*Note:*
– *For 'EASY SET' feature, please refer to page 10.*

### Tuning to radio stations

**1** Press **TUNER** (BAND) to select TUNER mode.
→ "TUNER" will be displayed.
A few seconds later, the current radio frequency will be displayed.

**2** Press **TUNER** (BAND) again to select the desired waveband : FM or MW.

**3** Press ◀◀ or ▶▶ for more than one second, then release.
→ The display will show "SEARCH" until a radio station with sufficient signal strength is found.
- Repeat this procedure until the desired station is reached.
- To tune to a weak station, briefly press ◀◀ or ▶▶ repeatedly until the display shows the desired frequency and/or when the best reception has been obtained.

### Storing Preset Stations

You can store up to 40 radio stations in the memory. When a preset radio station is selected, the preset number appears next to the frequency on the display.





## TUNER

**Automatic programming**

**1** Press **TUNER** (BAND).

**2** Press **PROGRAM** for more than one second.
→ The PROG flag starts flashing and "AUTO" will be displayed.
→ The system will search for every available station in the FM waveband first, then search the MW waveband.
→ All available stations will be stored automatically. The frequency and preset number will be displayed briefly.
→ The system will stop searching when all the available radio stations are stored or when the memory for 40 preset radio stations is used.
→ The system will remain tuned to the last stored preset radio station.

*Notes:*
– *You can cancel the automatic programming by pressing PROGRAM or ■ (on the system only).*
– *If you want to reserve a section of preset numbers, for example preset numbers 1 to 9, select preset 10 before starting automatic programming, only the preset numbers 10 to 40 will be programmed.*

**Manual programming**

**1** Press **TUNER** (BAND).

**2** Press **TUNER** (BAND) again to select the desired waveband : FM or MW.

**3** Press **PROGRAM** for less than one second.
→ The PROG flag starts flashing.
→ The next available preset number will be displayed for selection.

**4** Press ◀◀ or ▶▶ to tune to the desired frequency.
- If you wish to store the radio station to another preset number, press ▼ or ▲ to select the desired preset number.

**5** Press **PROGRAM** again.
→ The PROG flag disappears and the radio station will be stored.
- Repeat ***steps 3 – 5*** to store other preset radio stations.

*Notes:*
– *When 40 radio stations are stored and you attempt to store another radio station, the display will show "PROGRAM FULL". If you want to change an existing preset number, repeat steps 3 – 5.*
– *You can cancel manual programming by pressing ■ (on the system only).*
– *During programming, if no button is pressed within 20 seconds, the system will exit program mode automatically.*

### Tuning to Preset Radio Stations

- Press ▼ or ▲ to select the desired preset number.
→ The preset number, radio frequency, and waveband appear on the display.

### Changing the MW tuning grid

*(not available for version /30)*

The frequency step can be changed if necessary. In North and South America, the frequency step between adjacent channels in the MW band is 10 kHz. In other parts of the world, it is 9 kHz. The frequency step preset in the factory is 9 KHz.

*For MW Band*
*To change from 9 kHz to 10 kHz or vice versa*

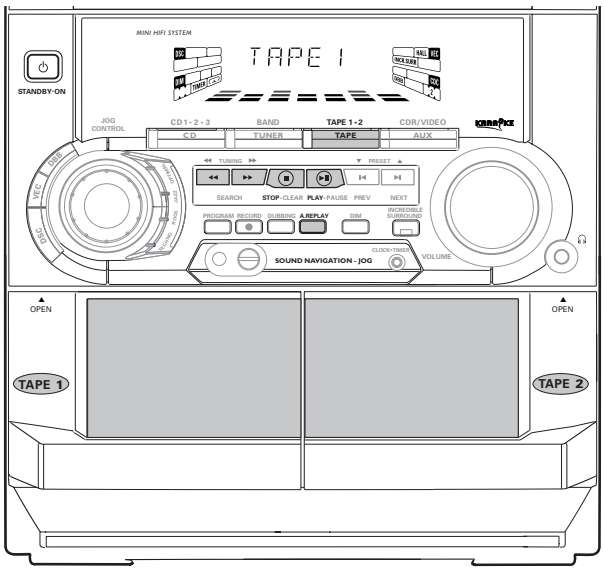
***Changing of tuning grid will erase all previously stored preset stations.***

**1** Disconnect the system from the AC power supply *(pull out the AC power cord)*.

**2** Press and hold **TUNER** and **TUNING** ▶▶ while reconnecting the system to the AC power supply.
→ Display will show "GRID 10" or "GRID 9".

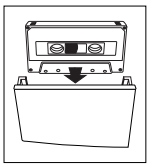
*Notes:*
– *GRID 9 indicates that the tuning grid is in step of 9 kHz in MW band. GRID 10 indicates that the tuning grid is in step of 10 kHz in MW band.*
– *FM tuning grid will also be changed from 50 kHz to 100 kHz or vice versa. All preset stations will also be erased.*

## TAPE




### Loading a tape

1 Press **OPEN**.
2 The tape deck door opens.
3 Load the tape with the open side downward and the full spool to the left.



4 Close the tape deck door.

### Auto Replay

- Press **A. REPLAY** to select either continuous AUTO REPLAY or ONCE during tape playback.
  → "AUTO REPLAY "(↻) or "ONCE "(1) will be displayed.

*Notes:*
– *This feature is available during tape playback only.*
– *When "AUTO REPLAY" is selected, the tape will rewind automatically at the end of playback for the selected side. Then it will start playing again. It will replay up to a maximum of 20 times until you press ■.*
– *When "ONCE" is selected, the tape will play the selected side once and then stop.*

### Tape Playback

1 Press **TAPE** (TAPE 1•2) to select TAPE mode.
  → "TAPE 1" or "TAPE 2" will be displayed and followed by "T 1 >>>" or "T2 >>>".
2 Load the tape into the selected tape deck.
3 Press ▶ to start playback.
  → "T 1" or "T2" with ">" scrolling right will be displayed.
- Press **A.REPLAY** to select the different type of playback mode *(see Auto Replay).*
4 Press ■ to end playback.
  → "T 1" or "T2" with ">>>" will be displayed.

### Rewind/Fast Forward

**When playback is stopped**

1 You can rewind or fast forward the tape by pressing ◀◀ or ▶▶ respectively.
  → If rewinding, "T 1 <" or "T2 <" with "<" scrolling left will be displayed.
  → If fast forwarding, "T 1 >" or "T2 >" with ">" scrolling right will be displayed.
  → The tape will stop automatically at the end of rewinding or fast forwarding.
2 Press ■ to stop rewinding or fast forwarding.

English

17

## TAPE

English

**During playback**

- Press and hold ◀◀ or ▶▶ until the desired passage is located.
  → "T 1 or T2" with "<< or >>"" scrolling left or right will be displayed depending on which button is pressed.
  → During searching, the sound is reduced to a low volume.
  → When you release ◀◀ or ▶▶, the tape continues playing.

*Notes:*
– *During rewinding or fast forwarding of a tape, it is also possible to select another source (e.g. CD, TUNER, or AUX).*
– *Before playing a tape, check and tighten slack tape with a pencil. Slack tape may get jammed or may burst in the mechanism.*
– *C-120 tape is extremely thin and is easily deformed or damaged. It is not recommended for use in this system.*
– *Store the tapes at room temperature and do not put them too close to a magnetic field (for example, a transformer, TV, or speaker).*

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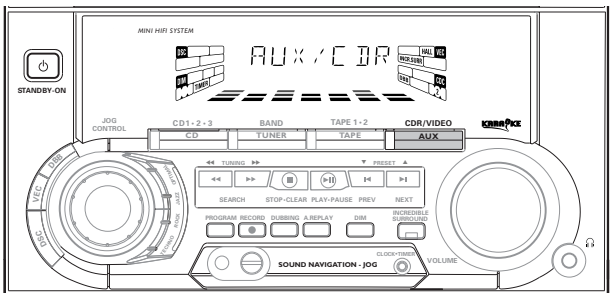
## AUX



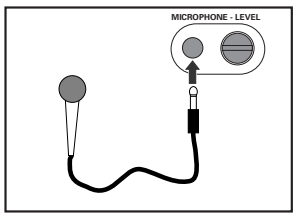

### Selecting External Equipment

If you have connected the audio out terminals of the external equipment (TV, VCR, Laser Disc player, DVD player or CD Recorder) to the AUX IN terminals, you can hear the enhanced sound from the system.

- Press **AUX (CDR/VIDEO)** to select the external equipment.
  → "AUX / CDR" will be displayed.

*Note:*
– *All the sound control features (e.g. DSC, DBB, etc.) are available for selection.*

## KARAOKE




### Microphone Mixing *(not available for version /30)*

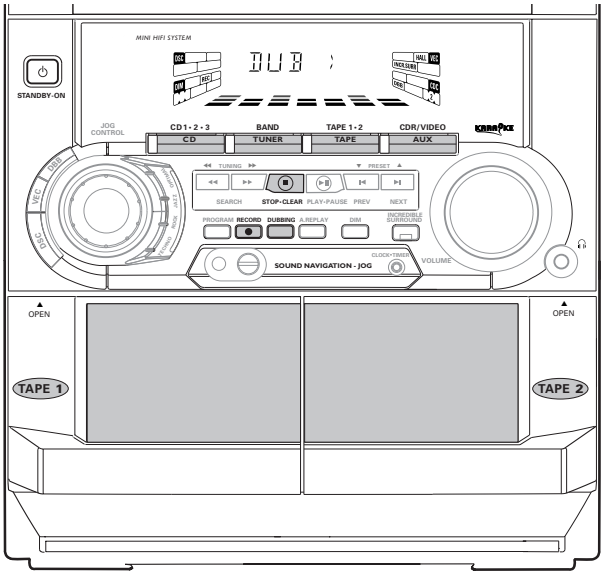
1 Set the **MIC LEVEL** control to the minimum level to prevent acoustic feedback (e.g. a loud howling sound) before you connect the microphone.
2 Connect a microphone to the **MICROPHONE** socket.
3 Press **CD**, **TUNER**, **TAPE** or **AUX**.
4 Play the selected source.
5 Adjust the volume level with **VOLUME** control.
6 Adjust the **MIC LEVEL** control to the mixing level that you want.
7 Start singing or talking through the microphone.

*Note:*
– *Keep the mic away from the speakers to prevent howling*

18

## RECORDING






*Notes:*

- *If you do not intend to record via the microphone, unplug the microphone to avoid accidental mixing with other recording source.*
- *For recording, use only tape of IEC type I (normal tape) or IEC type II ($CrO_2$).*
- *The tape is secured at both ends with leader tape. At the beginning and end of tape, nothing will be recorded for six to seven seconds.*
- *The recording level is set automatically, regardless of the position of VOLUME, DBB, Incredible Surround, DSC or VEC.*
- *To prevent accidental recording, break out the tab on the left shoulder of the tape side that you want to protect.*
- *If "CHECK TAPE" is displayed, the protection tab has been broken. Put a piece of clear adhesive tape over the opening. Do not cover the $CrO_2$ tape detection hole when covering the tab opening.*

### Recording the mixed sound / One Touch Recording

- During microphone mixing, you can record the mixed sound on a tape in tape deck 2 except dubbing mode.
- For One Touch Recording, as soon as you press RECORD, the current source (CD, TUNER or AUX) will be recorded on tape deck 2.

1 Load a blank tape in tape deck 2.
2 Press **RECORD** to start recording.
→ The **REC** flag starts flashing.
3 Press ■ to stop recording.

*Note:*

- *When you press RECORD while in TAPE mode, "SELECT SOURCE" will be displayed. One Touch Recording is not possible in TAPE mode.*

### CD Synchro Start Recording

1 Load a blank tape into tape deck 2 and a disc into a disc tray.
2 Press **CD** to select CD mode.
• You can program the tracks in the order you want them to be recorded (see Programming Tracks). If not, select the disc by pressing **CD** (CD 1•2•3) and the tracks are recorded according to the order on the selected disc.
3 Press **RECORD** to start recording.
→ The **REC** flag starts flashing.
• CD will start playback automatically.
4 Press ■ to stop recording.



## RECORDING



### Dubbing tapes *(from tape deck 1 to tape deck 2)*

1 Press **TAPE** ( TAPE 1•2 ) to select tape deck 2.
2 Load the prerecorded tape into tape deck 1 and a blank tape into tape deck 2 with full spool to the left.
3 Press **DUBBING**
→ "DUB" with ">" scrolling right will be displayed.
• Dubbing will start immediately.
→ The **REC** flag starts flashing.
4 Press ■ to stop dubbing.

*Notes:*

- *At the end of side A, flip the tapes to side B and repeat the procedure.*
- *Dubbing of tapes is only possible from tape deck 1 to tape deck 2.*
- *To ensure good dubbing, use tapes of the same length.*
- *You can listen to other source while dubbing.*

### Recording from other sources

*(only on tape deck 2)*

1 Press **TAPE** ( TAPE 1•2 ) to select tape deck 2.
2 Load a blank tape into tape deck 2 with the open side downward.
3 Press **CD**, **TUNER** or **AUX**.
• Start playback of the selected source.
4 Press **RECORD** to start recording.
→ The **REC** flag starts flashing.
5 Press ■ to stop recording.

*Notes:*

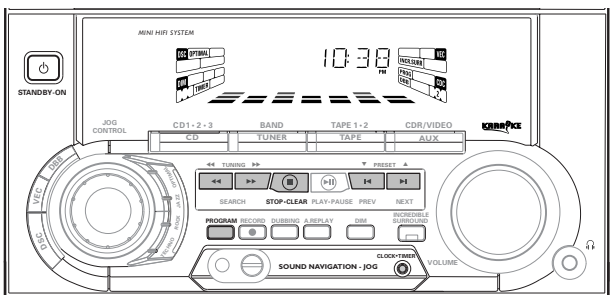
- *During recording, it is not possible to listen to another source.*

### Digital Recording via Digital Out

*For CD digital recording, please refer to the Instructions Manual of the CD Recorder, digital audio equipment, etc.*



## CLOCK




### View Clock

You can view the clock (if it is set) if the system is in Standby mode or when any sound source is selected (CD, TUNER, etc.). The clock will be displayed for about seven seconds.

- Press **CLOCK•TIMER** briefly.
→ " 10:38 **PM** or 22:38" (the current time in either 12- or 24-hour mode) will be displayed depending on whether you have selected 12- or 24-hour mode.
→ "--:--" will be displayed if the clock is not set.

### Clock Setting

The clock can be set in either 12- or 24-hour mode, e.g. " 12:00 **AM**" or "00:00". Before setting the clock, you must be in the View Clock mode.

1 Press **CLOCK•TIMER** to select clock mode.
2 Press **PROGRAM** to select 12- and 24-hour mode.
→ If 12-hour mode is selected, " 12:00" starts flashing and the **AM** lights up.
→ If 24-hour mode is selected, "00:00" starts flashing.
3 Set the hour with ◀◀ or ▶▶ on the system.
4 Set the minute with ⏮ or ⏭ on the system.

## TIMER

**5** Press **CLOCK•TIMER** again to store the setting.
→ The clock starts.

• To exit without storing the setting, press ■ on the system.

*Notes:*
– *During clock setting, if no button is pressed within 90 seconds, the system will exit clock setting mode automatically.*
– *When a power interruption occurs, the clock setting is erased.*

### Timer Setting

• The system can switch on to CD , TUNER or TAPE 2 mode automatically at a preset time. It can serve as an alarm to wake you up.
• Before setting the timer, make sure the clock is set correctly.
• The timer will always be switched on once it is set.
• **The volume of the timer will increase from the minimum level until the volume level before the set is switched to standby mode.**

**1** Press and hold **CLOCK•TIMER** for more than ***2 seconds*** to select timer mode.
→ "12:00 **AM**" or "00:00" or the last timer setting starts flashing depending on whether you have selected 12- or 24-hour mode.
→ The **TIMER** flag starts flashing.
→ The selected source is lit while other available sources are flashing.
**2** Press **CD, TUNER** or **TAPE** to select the desired source.
• Before selecting CD or TAPE, make sure a CD or tape is loaded in the CD carousel tray or tape deck 2
**3** Press ◀◀ or ▶▶ on the system to set the hour for the timer to start.
**4** Press ⏮ or ⏭ on the system to set the minute for the timer to start.
**5** Press **CLOCK•TIMER** to store the start time.
→ The timer is now set.
→ The **TIMER** flag remains on the display.
• At the preset time, the timer will be activated.
→ The selected source will be played.

*Notes:*
– *During timer setting, if no button is pressed within 90 seconds, the system will exit timer setting mode automatically.*
– *If the source selected is TUNER, the last tuned frequency will be switched on.*
– *If the source selected is CD, playback will begin with the first track of the selected disc or program. If the CD trays are empty, the TUNER will be selected instead.*
– *The timer will not activate if a recording is in progress.*

**To switch off the TIMER**
**1** Press and hold **CLOCK•TIMER** for more than ***2 seconds***.
**2** Press ■ on the system to cancel the timer.
→ The timer is now switched off.
→ The display will show "CANCEL" and the **TIMER** flag disappears.

**To start the TIMER again** *(for the same preset time and source)*
**1** Press and hold **CLOCK•TIMER** for more than ***2 seconds***.
**2** Press **CLOCK•TIMER** again to store the start time.
→ The timer is now on.
→ The **TIMER** flag appears on the display.

## SLEEP TIMER

English

### Sleep Timer *(only on remote control)*

This feature allows you to select a length of time after which the system will switch to the standby mode automatically.

**1** Press **SLEEP** on the remote control repeatedly to select a period of time.
→ The selections are as follows (time in minutes):
60 → 45 → 30 → 15 → OFF → 60 …
→ "SLEEP xx" or "OFF" will be displayed. "xx" is the time in minutes.
**2** When you reach the desired length of time, stop pressing the **SLEEP** button.
→ After this amount of time passes, the system will switch to the standby mode.

**To switch off the Sleep Timer**
• Press **SLEEP** repeatedly until "OFF" is displayed, or press the **STANDBY ON** button.



## MAINTENANCE

### Maintenance

**Cleaning the Cabinet**
• Use a soft cloth slightly moistened with a mild detergent solution. Do not use a solution containing alcohol, spirits, ammonia or abrasives.

**Cleaning Discs**
• When a disc becomes dirty, clean it with a cleaning cloth. Wipe the disc from the center out.
• Do not use solvents such as benzine, thinner, commercially available cleaners, or antistatic spray intended for analog records.

**Cleaning the CD lens**
• After prolonged use, dirt or dust may accumulate at the CD lens. To ensure good playback quality, clean the CD lens with Philips CD Lens Cleaner or any commercially available cleaner. Follow the instructions supplied with cleaner.

**Cleaning the Heads and the Tape Paths**
• To ensure good recording and playback quality, clean the heads, the capstan(s), and pressure roller(s) after every 50 hours of tape operation.
• Use a cotton swab slightly moistened with cleaning fluid or alcohol.
• You can also clean the heads by playing a cleaning tape once.

**Demagnetizing the heads**
• Use a demagnetizing tape available at your dealer.

## TROUBLESHOOTING

English

**Warning! Under no circumstances should you try to repair the set yourself as this will invalidate the guarantee. Do not open the set as there is a risk of electric shock.**

• If a fault occurs, check the points listed below before taking the system for repair.
• Should any problems persist after you have made these checks, consult your nearest dealer or service center.

### CD Player Operation

**"NO DISC" is displayed.**
• The disc is inserted upside down.
→ *Place CD with printed side up.*
• Moisture condensation at the lens.
→ *Wait until lens has adjusted to normal room temperature.*
• There is no disc in the CD tray.
→ *Insert a CD.*
• The CD is dirty, badly scratched or warped.
→ *Clean or replace the CD.*
• The CD lens is dirty or dusty.
→ *See section under Maintenance (page 23).*

**"DISC NOT FINALIZED" is displayed.**
• The CD-RW or CD-R disc is not properly recorded for use with a standard CD player.
→ *Read the instruction booklet of your CD-Rewritable or CD-Recorder on how to finalize a recording.*
• The CD is badly scratched or dirty.
→ *Replace or clean CD.*

### Radio Reception

**Poor radio reception.**
• The signal is too weak.
→ *Adjust the antenna.*
→ *Connect an external antenna for better reception.*
• The TV or VCR is too close to the stereo system.
→ *Separate the stereo system from the TV or VCR.*

**Cannot tune to station**
• Wrong tuning grid.
→ *Switch to the correct tuning grid.*

English

## Tape Deck Operation

**"RECORDING ACTIVE" is displayed.**
- A recording is in progress.

→ *Stop the recording or wait until it is finished.*

**"TAPE DUBBING ONLY" is displayed.**
- Tape dubbing is only possible in tape mode.

→ *Switch source to tape mode.*

**Recording or playback cannot be made or there is a decrease in audio level.**
- Dirty tape heads, capstans or pressure rollers.

→ *See section on tape deck maintenance (page 23).*
- Magnetic build-up in the record/ playback head.

→ *Use demagnetizing tape.*

**Tape deck door cannot open.**
- Power failure or AC power plug disconnect from the wall outlet during tape playback.

→ *Reconnect the AC power plug and switch on the system again.*

## General

**System does not react when any button is pressed.**
- Electrostatic discharge.

→ *Press STANDBY ON to switch the system off. Remove the AC power plug from the wall outlet, then reconnect the power plug and switch on the system again.*

**No or poor sound.**
- Volume is not turned up.

→ *Adjust VOLUME.*
- The headphones are connected.

→ *Disconnect the headphones.*
- Speakers are not connected or are connected wrongly.

→ *Check that the speakers are connected correctly.*

→ *Make sure the stripped speaker wire is clamped.*

**Reversed left and right sound.**
- Speakers are connected wrongly.

→ *Check the speaker connections and location.*

**Lack of bass sound or apparently imprecise physical location of musical instruments.**
- Speakers are connected wrongly.

→ *Check the speaker connection for proper phasing, colored/black wires to colored/black terminals.*

**Remote control has no effect on the system.**
- Wrong source is selected.

→ *Select the source (CD, TUNER, etc.) before pressing the function button, (▶, ⏮, ⏭, etc.).*
- The distance to the system is too large.

→ *Reduce the distance.*
- Batteries are inserted incorrectly.

→ *Insert the batteries with their polarities (+/– signs) as indicated.*
- Batteries are exhausted.

→ *Replace the batteries.*

**Timer is not working.**
- Clock is not set.

→ *Set the clock.*
- Timer is not switched on.

→ *Press CLOCK•TIMER to switch on the timer.*
- Recording is in progress.

→ *Stop recording.*

**Clock setting is erased.**
- There was a power failure.

→ *Reset the clock.*

**System displays features automatically; buttons flash continuously.**
- Demonstration mode is switched on.

→ *Press and hold ■ (on the system) for 5 seconds to switch off the demonstration.*

**All lighted buttons are not lit.**
- Display is switch on in DIM 3 mode.

→ *Press DIM until DIM OFF display mode is shown.*

# ADDITIONAL FEATURES FOR /22/34

English

## Receiving RDS Radio Station

RDS (Radio Data System) is a broadcasting service that allows FM stations to send additional information along with the regular FM radio signal. This additional information can contain:

- **STATION NAME:** The radio station name is displayed.
- **PROGRAM TYPE:** The following program types exist and can be received by your tuner: News, Affairs, Info, Sport, Educate, Drama, Culture, Science, Varied, Pop M, Rock M, M.O.R. (middle of the road music), Light M, Classics, Other M, No type.
- **RADIO TEXT (RT):** text messages appear in the display.

When you have tuned to a RDS station, the RDS logo (RDS) and the radio station name will appear on the display:

- The display normally shows the radio station name if available.
  By repeatedly pressing **RDS** button you can change the type of display information:
  → The display shows in turn: STATION NAME → PROGRAM TYPE → RADIO TEXT → TUNED FREQUENCY → STATION NAME ...

*Note:*
– *When you press the RDS button and the display shows "NO RDS", it indicates that either the tuned station is not transmitting RDS signal or it is a non RDS station.*

**RDS Clock**
Some RDS station may be transmitting a real clock time at an interval of every minute.

**Setting the time with RDS clock**
1 Press **CLOCK•TIMER**.
→ "--:--" or current time appears on the display.
2 Press **CLOCK•TIMER** once more to enter clock setting mode.
→ "00:00" or current time starts flashing.
3 Press **RDS**.
→ The message "SEARCH RDS TIME" will be displayed.
→ If the current station is not receiving any RDS information, "NO RDS TIME" will be displayed.
→ When the RDS clock is read, "RDS TIME" will be displayed. The current clock time is displayed for 2 seconds and will be stored automatically.
→ If within 90 seconds, the RDS time is not detected, "NO RDS TIME" will be displayed.

*Note:*
– *Some RDS station may be transmitting a real time clock at a minute interval. The accuracy of the transmitted time depends on the transmitting RDS station.*

## News *(only available in Radio Station with RDS)*

You can activate NEWS function in Standby or any source mode except Tuner mode. Once the News PTY (program type) is detected in a RDS station, it will switch to TUNER mode automatically.

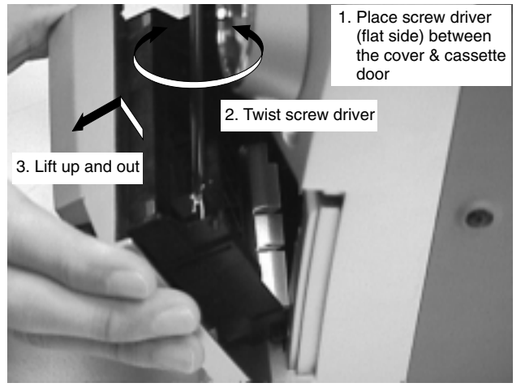
**To start NEWS function**
1 Press **NEWS**.
- The **NEWS** and "NEWS" will be displayed.
- It will scan stations stored in the first 5 preset and wait for the News Program Type data to be available in any of these RDS stations. During the search :
  → The current source activity will remain uninterrupted.
  → If no RDS station is found in the first 5 presets, the NEWS function will be switched off. The display will show "NO RDS NEWS" and **NEWS** will disappear from the display.
- When NEWS transmission is detected, the system will switch to Tuner mode.
  → The **NEWS** starts flashing.

**To cancel NEWS function**
- Press **NEWS** again.
  → The **NEWS** disappears and "NEWS OFF" will be displayed.

*Notes:*
– *If you are listening to a non RDS TUNER radio station and should you decide to hear NEWS, first select other source (e.g. CD, TAPE or AUX), then press NEWS.*
– *Before using the NEWS feature, ensure that the first 5 presets are RDS stations.*
– *The NEWS works only once for each activation.*
– *During News bulletin, you can press any available source or Tuner function keys to cancel NEWS function and execute the relevant source mode.*
– *If set is switched to Tuner source, the NEWS function will be cancelled, "NEWS OFF" will be displayed immediately after the "TUNER" message.*

# DISMANTLING INSTRUCTIONS

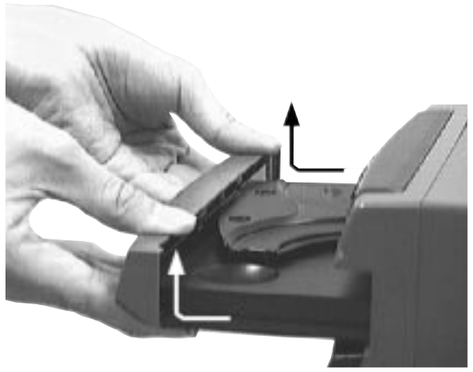
## *Dismantling of the Cassette Cover*



Cassette Cover

## *Dismantling of the Front Panel*

1) Slide out the tray an remove the Cover Tray CDC (pos 107) as indicated.
2) Loosen the 8 screws to separate the Front Panel from the rear portion.
   - 2 screws B on the front
   - 2 screws each on the left & right side
   - 2 screws at the bottom



## *Dismantling of the Cover Control on the Front (see Notes)*

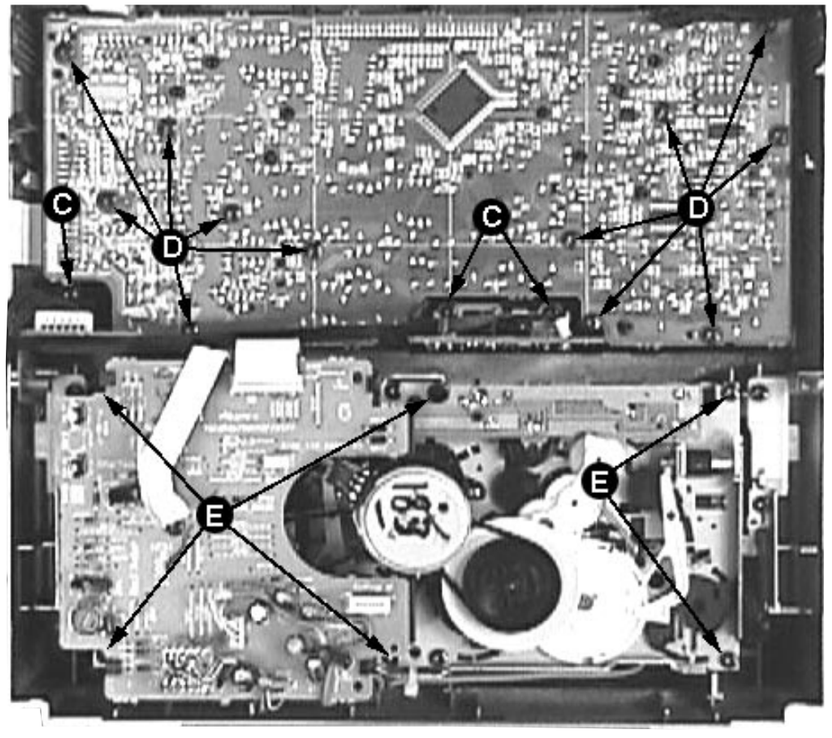
1) Insert a strong string into the slot between the Volume knob (pos 146) and Cover Ring Volume (pos 144, looped it 1,5 turns securely around the Volume knob and pulled it out as shown.
2) Do likewise for the Jog Rotary knob (pos 145).
3) Remove the 2 hidden screws A to take out the Cover Control Assembly (pos 153 + 143 + 144).

***Note**: Only the Lightguide DSC (pos 127) is sandwiched between the Front Cabinet (pos 101) & Cover Control (pos 153).*

3-1

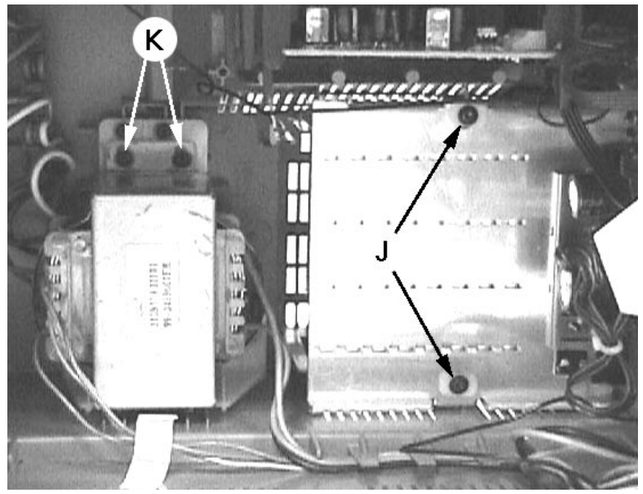
## *Dismantling of Assemblies on the Front Panel*

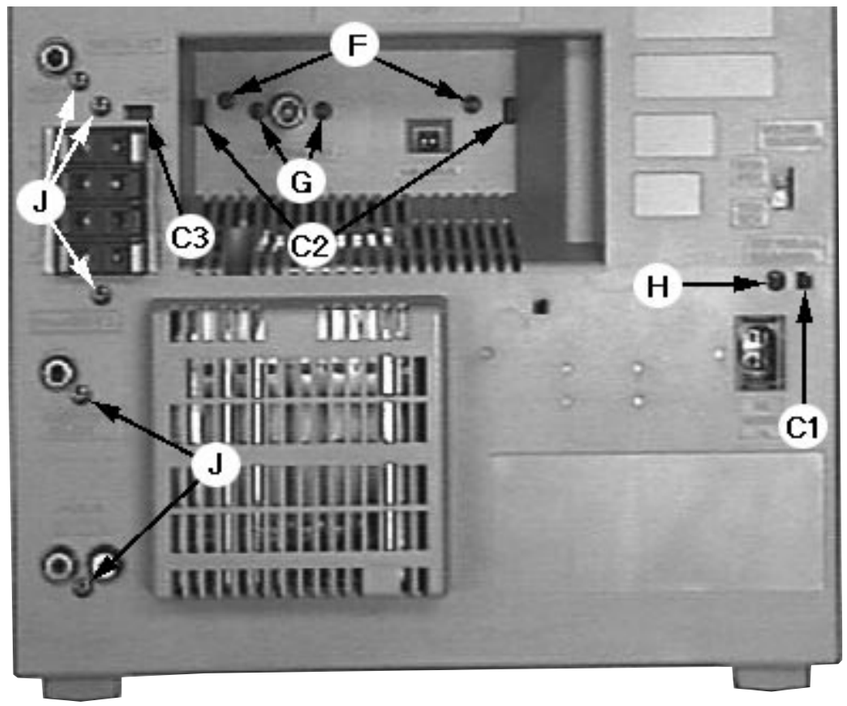
1) Remove the Volume and Jog Rotary knobs (pos 145 & 146) as per step 1 and 2 of ***Dismantling the Cover Control on the Front.***
2) Remove 3 screws C to loosen the Headphone board (1x) and the Karaoke board (2x).
   Note: Karaoke board is for some versions only.
3) Remove 12 screws D as indicated to loosen the Front board.
4) Remove 6 screws E to loosen the ETF7 Module



### *Dismantling of Rear Portion*

1) Remove 1 screw H & uncatch C1 to loosen the Mains socket board.
2) Remove 2 screws F, 2 screws G and uncatch C2 to loosen the Tuner board assembly.
3) Remove 7 screws J (5x on the rear and 2x on the heatsink) and uncatch C3 to loosen the Combi board (Main part).
4) Remove 2 screws K to loosen the Mains Transformer.



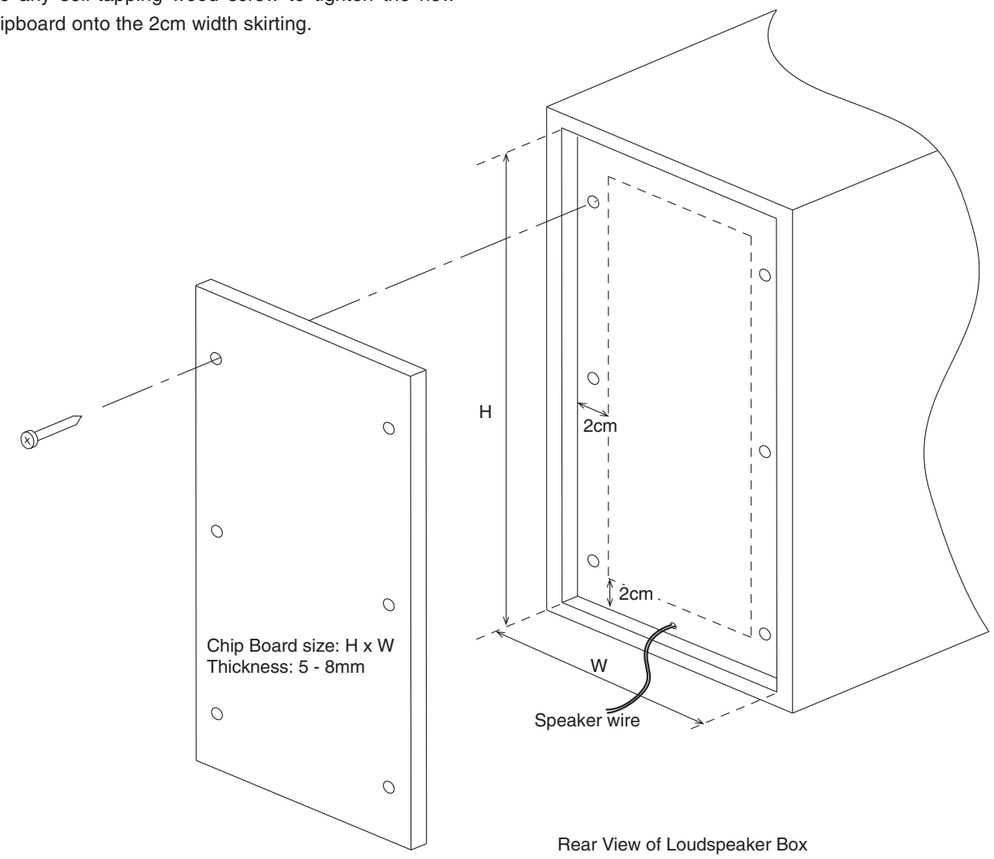





### *Dismantling of Left/Right Loudspeaker Box (not recommended because of high risk of damage)*

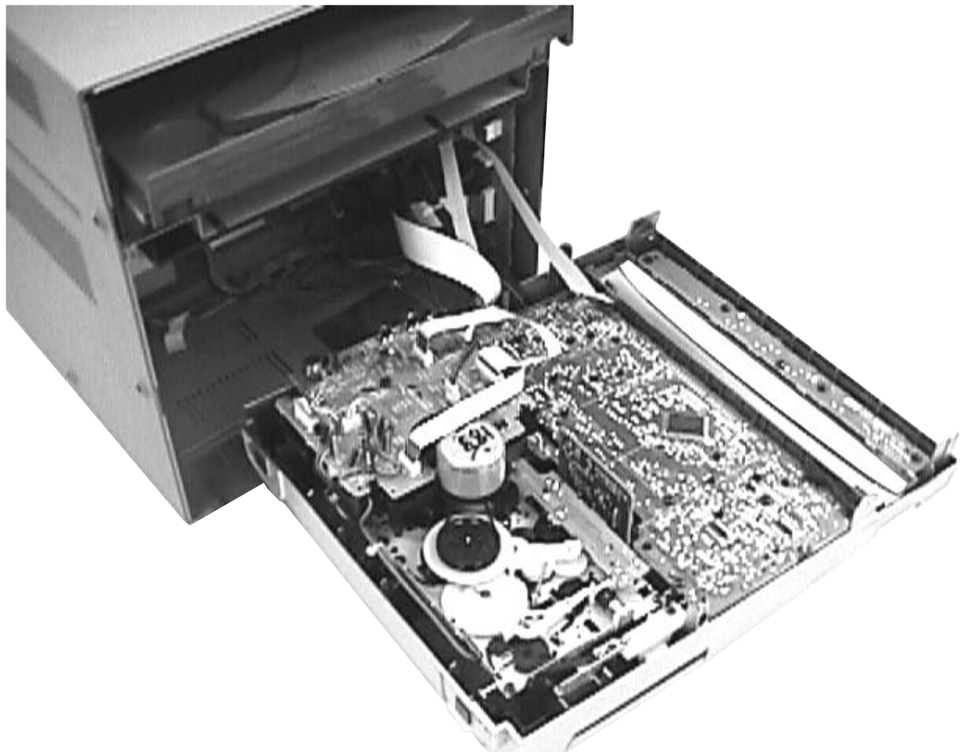
***This Loudspeaker Box is not designed to be repaired! The steps below makes it possible to replace defective parts but the service repairman must exercise extreme care not to damage the Louspeaker box.***

1) Marked out a rectangular area on the Rear of the Loudspeaker box giving it a 2cm skirting all round (see picture).
2) Use a zigsaw (or open-end hand-held saw) cut along the earlier marked out line.
   ***Caution: Be extra careful not to cut the Loudspeaker Wires near the bottom of the LS box.***
3) Prepare a Chipboard (thickness 5 - 8 mm) of size L x W to cover back the cut-out after replacement of defective parts.
4) Use any self-tapping wood screw to tighten the new Chipboard onto the 2cm width skirting.

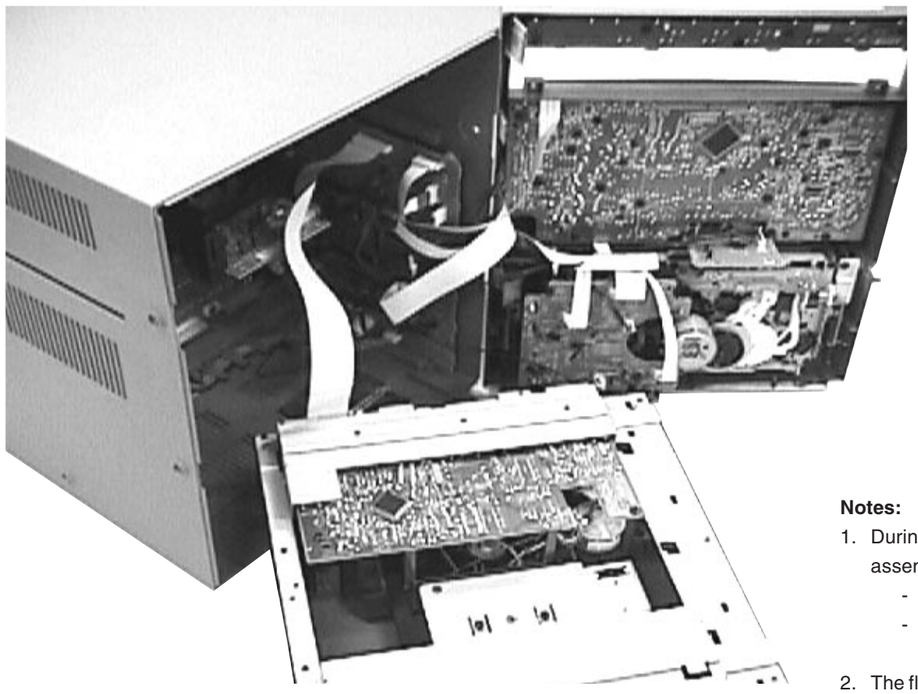



Rear View of Loudspeaker Box

Service pos A



Service pos B



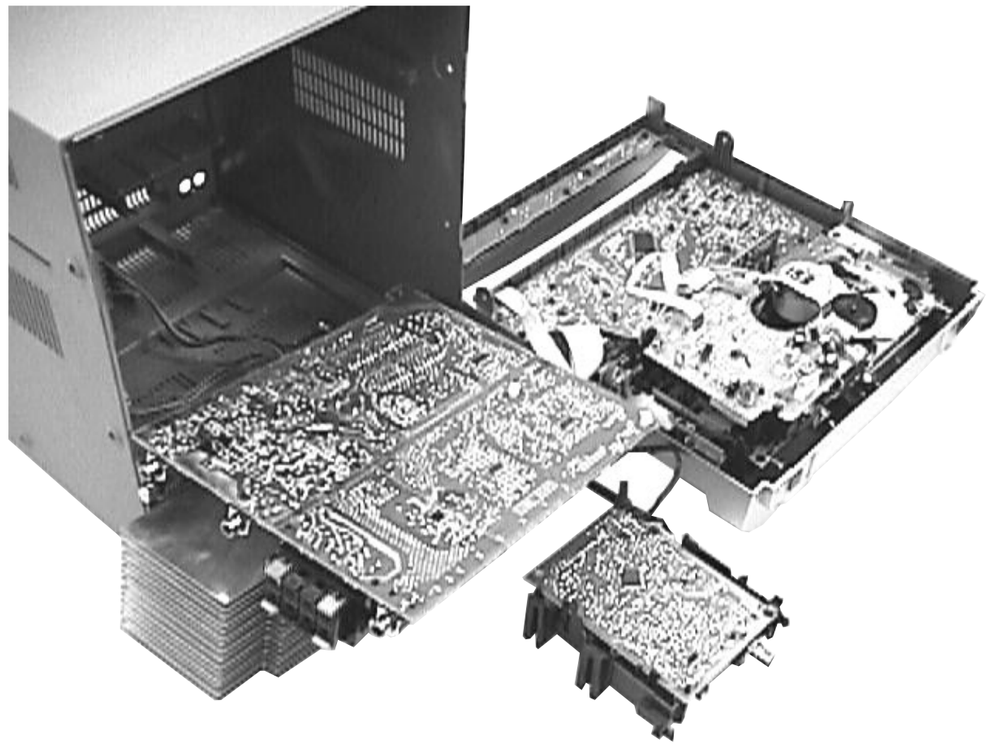
**Notes:**

1. During repair it is possible to disconnect the following assemblies or modules while repairing other areas:
   - Tuner Board
   - CDC Module

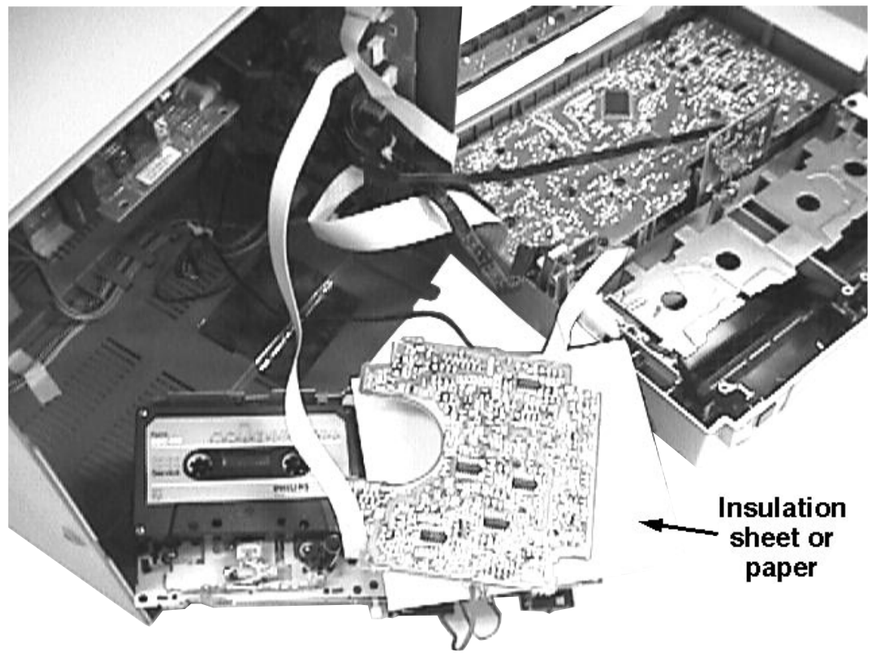
2. The flex cables are very fragile, care should be taken not to damage them during repair. After repair, be very sure that the flex cables are inserted properly into the flex sockets before encasing, otherwise faults may occurs.

3-3

Service pos C

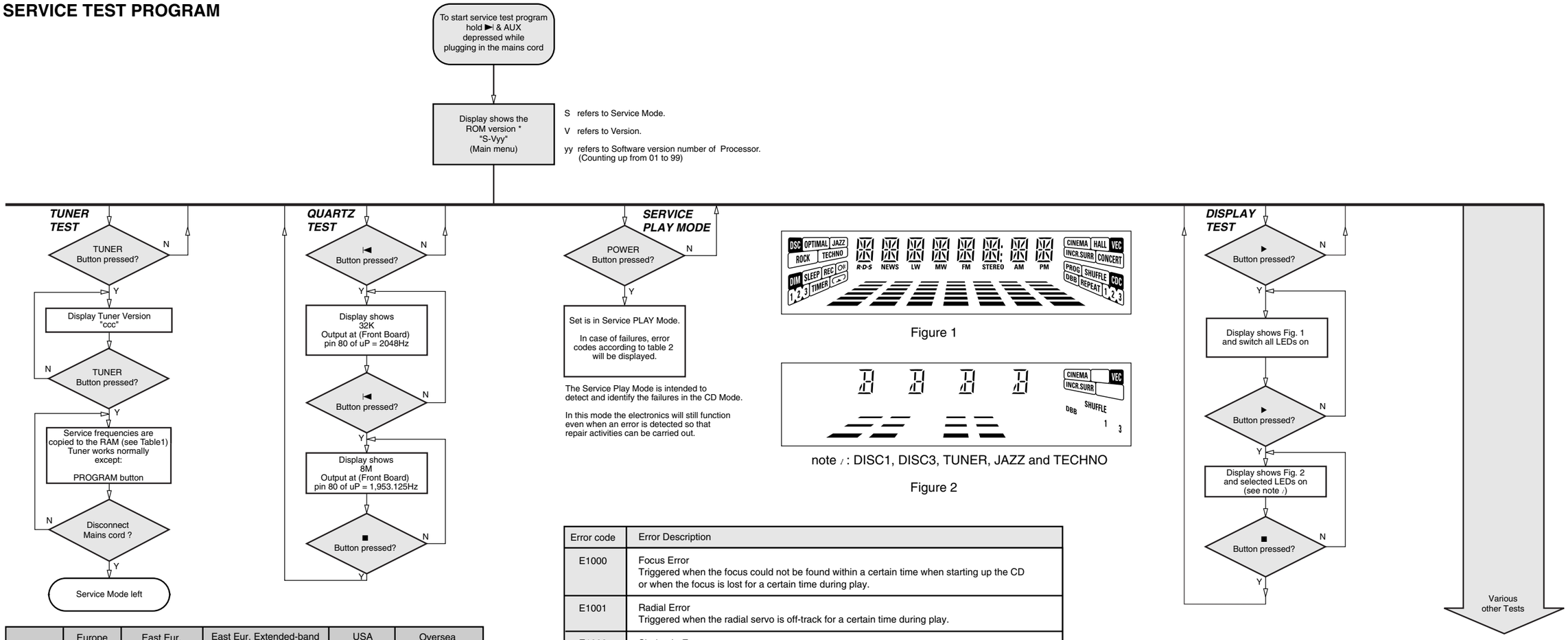


Service pos D



3-4

# SERVICE TEST PROGRAM


To start service test program hold ►I & AUX depressed while plugging in the mains cord
Display shows the ROM version * "S-Vyy" (Main menu)
S refers to Service Mode.
V refers to Version.
yy refers to Software version number of Processor. (Counting up from 01 to 99)
TUNER TEST
TUNER Button pressed?
Display Tuner Version "ccc"
TUNER Button pressed?
Service frequencies are copied to the RAM (see Table1) Tuner works normally except: PROGRAM button
Disconnect Mains cord ?
Service Mode left
QUARTZ TEST
Button pressed?
Display shows 32K Output at (Front Board) pin 80 of uP = 2048Hz
Button pressed?
Display shows 8M Output at (Front Board) pin 80 of uP = 1,953.125Hz
Button pressed?
SERVICE PLAY MODE
POWER Button pressed?
Set is in Service PLAY Mode.
In case of failures, error codes according to table 2 will be displayed.
DISPLAY TEST
Button pressed?
Display shows Fig. 1 and switch all LEDs on
Button pressed?
Display shows Fig. 2 and selected LEDs on (see note /)
Button pressed?
Various other Tests

The Service Play Mode is intended to detect and identify the failures in the CD Mode.

In this mode the electronics will still function even when an error is detected so that repair activities can be carried out.




Figure 1




note / : DISC1, DISC3, TUNER, JAZZ and TECHNO

Figure 2

| PRESET | Europe "EUR" | East Eur. "EAS" | East Eur. Extended-band "EAS" | USA "USA" | Oversea "OSE" |
|---|---|---|---|---|---|
| 1 | 87.5MHz | 87.5MHz | 65.81MHz | 87.5MHz | 87.5MHz |
| 2 | 108MHz | 108MHz | 108MHz | 108MHz | 108MHz |
| 3 | 531kHz | 531kHz | 74MHz | 530kHz | 531/530kHz* |
| 4 | 1602kHz | 1602kHz | 87.5MHz | 1700kHz | 1602/1700kHz* |
| 5 | 558kHz | 558kHz | 531kHz | 560kHz | 558/560kHz* |
| 6 | 1494kHz | 1494kHz | 1602kHz | 1500kHz | 1494/1500kHz* |
| 7 | 153kHz | 87.5MHz | 558kHz | 98MHz | 87.5/98MHz* |
| 8 | 279kHz | 87.5MHz | 1494kHz | 87.5MHz | 87.5MHz |
| 9 | 198kHz | 87.5MHz | 98MHz | 87.5MHz | 87.5MHz |
| 10 | 98MHz | 87.5MHz | 70.01MHz | 87.5MHz | 87.5MHz |
| 11 | 87.5MHz | 98MHz | 65.81MHz | 87.5MHz | 98/87.5MHz* |

Table 1

Note: * Depending on the selected grid frequency (9 or 10kHz)
By holding the TUNER and ►► buttons depressed while switching on the Mains supply, one of the undermentioned features will be activated:
- the tuning grid frequency is toggled between 9kHz and 10kHz for the Oversea (/21) version.
- the extended FM1 (65.81MHz - 74MHz) is toggled on and off for East Eur. (/34) version.

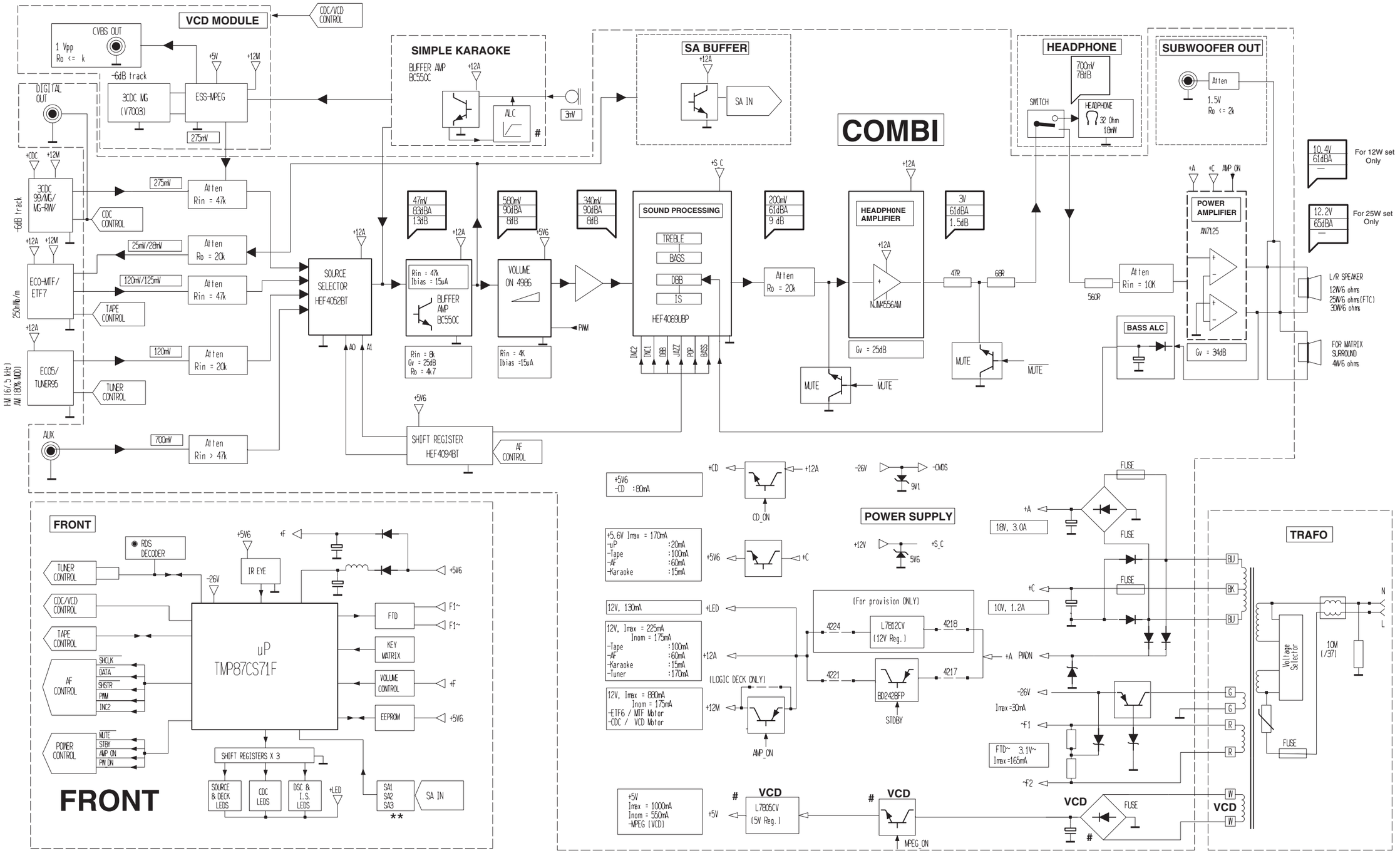
| Error code | Error Description |
|---|---|
| E1000 | Focus Error<br>Triggered when the focus could not be found within a certain time when starting up the CD or when the focus is lost for a certain time during play. |
| E1001 | Radial Error<br>Triggered when the radial servo is off-track for a certain time during play. |
| E1002 | Sledge In Error<br>The sledge did not reach its inner position (inner-switch is still close) before approximately 6 Sec. have passed by. Inner-switch or sledge motor problem. |
| E1003 | Sledge Out Error<br>The sledge did not come out of its inner position (inner-switch is still open) before approximately 250 mSec. have passed by. Inner-switch or sledge motor problem. |
| E1005 | Jump-offtrack error<br>Triggered in normal play when the jump destination could not be found within a certain time. When this error occurred, software will try to recover by initiating the jump command again. If it is recoverable, the disc will continue to play. |
| E1006 | Subcode Error<br>Triggered when a new subcode was missing for a certain time during play. |
| E1007 | PLL Error<br>The Phase Lock Loop could not lock within a certain time. |
| E1008 | Turntable Motor Error<br>Generated when the CD could not reached 75% of speed during startup within a certain time. Discmotor problem. |
| E1020 | Focus Search Error<br>The focus point has not been found within a certain time. |
| E1070 | The carousel switch is not open within certain time. This can happen when either the switch is defective and closed all the time, or when the carousel is blocked when located exactly at a disc position. |
| E1071 | The carousel position switch did not close within a certain time. This can happen when the switch is defective and never closes electrically, or when the carousel is blocked in between two disc positions. The time-out is approximately 5 Sec. |
| E1079 | The drawer could not enter the inside position is opening again. This can be caused because the drawer is blocked by something and cannot go fully inside, or the drawer switch is defective and does not close. |

Table 2

| *TEST* | *Activated with* | *ACTION* |
|---|---|---|
| EEPROM TEST | ►►<br>■ to Exit | A test pattern will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test pattern correctly, otherwise "ERROR" will be displayed. |
| EEPROM FORMAT | ◄◄ | Load default data. Display shows "NEW" for 1 second.<br>***Caution!***<br>***All presets from the customer will be lost!!*** |
| ENCODER TEST | Volume Knob<br>or<br>Jog Shuttle knob | Display shows value for 2 seconds.<br>Values increases or decreases in steps of 1 until 0 (Min.) or 40 (Max.) is reached. |
| LEAVE SERVICE TESTPROGRAM | Disconnect mains cord | |

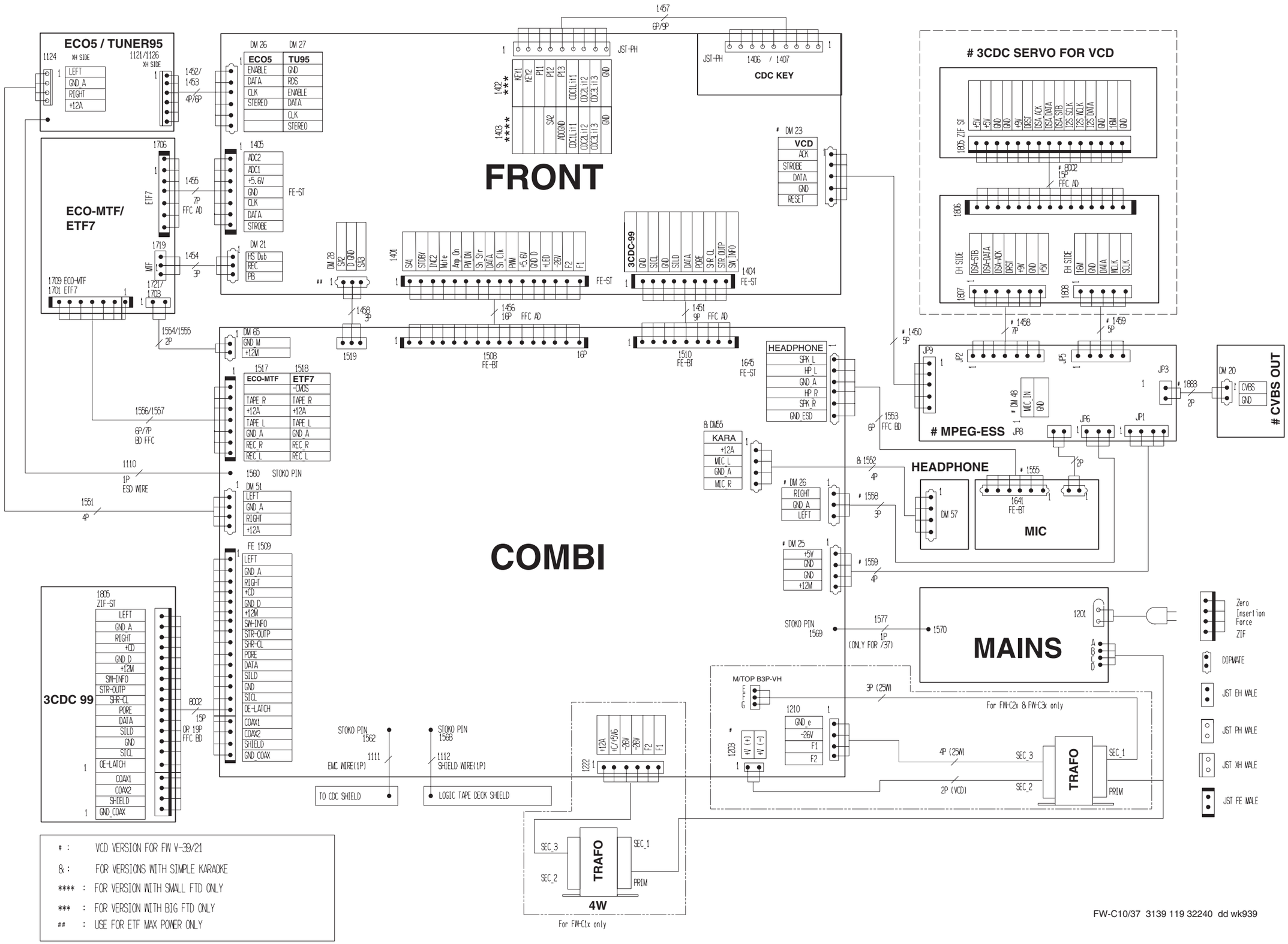
4-1

## SET BLOCK DIAGRAM



5-1

## SET WIRING DIAGRAM



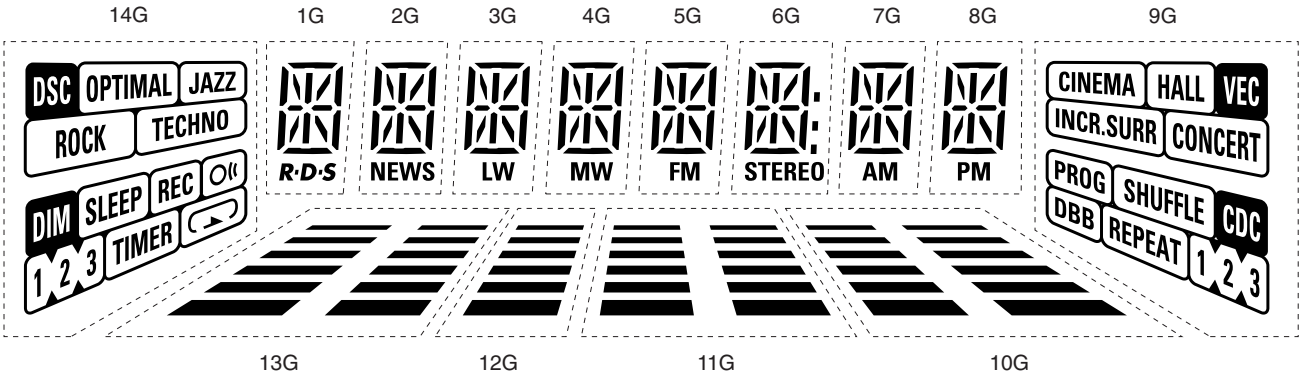

FW-C10/37 3139 119 32240 dd wk939

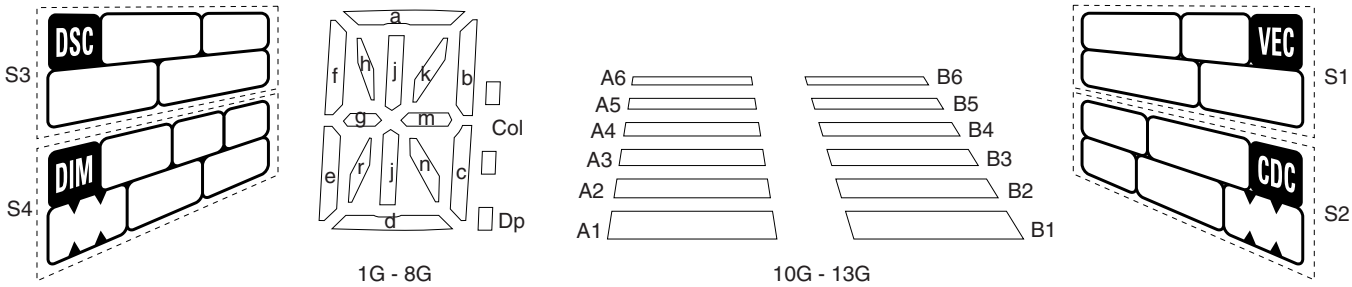
# FRONT BOARD

**TABLE OF CONTENTS**

FTD Display pin connection ..... 6-2
Variation table ..... 6-3
Circuit diagram ..... 6-4
Component & Chip layout ..... 6-5
Electrical parts list ..... 6-6

## FTD DISPLAY PIN CONNECTIONS




| | 1G | 2G | 3G | 4G | 5G | 6G | 7G | 8G | 9G | 10G | 11G | 12G | 13G | 14G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P1 | a | a | a | a | a | a | a | a | CINEMA | A1 | A1 | A1 | A1 | OPTIMAL |
| P2 | h | h | h | h | h | h | h | h | HALL | A2 | A2 | A2 | A2 | JAZZ |
| P3 | j | j | j | j | j | j | j | j | S1 | A3 | A3 | A3 | A3 | S3 |
| P4 | k | k | k | k | k | k | k | k | CONCERT | A4 | A4 | A4 | A4 | TECHNO |
| P5 | b | b | b | b | b | b | b | b | SHUFFLE | A5 | A5 | A5 | A5 | |
| P6 | f | f | f | f | f | f | f | f | S2 | A6 | A6 | A6 | A6 | REC |
| P7 | m | m | m | m | m | m | m | m | 3 | - | - | - | - | |
| P8 | g | g | g | g | g | g | g | g | 2 | - | - | - | - | |
| P9 | c | c | c | c | c | c | c | c | 1 | B1 | B1 | - | B1 | TIMER |
| P10 | e | e | e | e | e | e | e | e | REPEAT | B2 | B2 | - | B2 | 3 |
| P11 | r | r | r | r | r | r | r | r | DBB | B3 | B3 | - | B3 | 2 |
| P12 | n | n | n | n | n | n | n | n | PROG | B4 | B4 | - | B4 | 1 |
| P13 | d | d | d | d | d | d | d | d | INCR.SURR | B5 | B5 | - | B5 | S4 |
| P14 | R·D·S | NEWS | LW | MW | FM | STEREO | AM | PM | - | B6 | B6 | - | B6 | SLEEP |
| P15 | - | - | - | - | - | Dp | - | - | - | - | - | - | - | ROCK |
| P16 | - | - | - | - | - | Col | - | - | - | - | - | - | - | - |

Front Board application

| | |
|---|---|
| A5272 | FW-C1/37, FW-C10/22/34/37 |
| A5273 | FW-C3/37, FW-C30/30/37, FW-C35/37 |
| A5274 | FW-C38/21/21M, FW-C39/21/21M/33 |
| A5275 | FW-C28/33 |
| A5276 | FW-C38/22/34 |
| A5277 | FW-C28/22/34 |
| A5307 | FW-C30/21/21M |
| A5308 | FW-C38/37, FW-C39/30 |
| A5344 | FW-V39/21M/21K |
| A5348 | FW-C10/21 |
| A5350 | FW-V28/21M |
| A5365 | FW-C28/21M |

| FEATURES: | A5272 | A5273 | A5274 | A5275 | A5276 | A5277 | A5307 | A5308 | A5344 | A5348 | A5350 | A5365 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RDS | - | - | - | - | x | x | - | - | - | - | - | - |
| Rotary Volume | - | x | x | x | x | x | x | x | x | - | x | x |
| Jog Control | - | x | x | - | x | - | x | x | x | - | - | - |
| Spectrum Analyzer | - | - | x | - | x | - | - | x | x | - | - | - |
| Biplaner LED | - | x | x | x | x | x | x | x | x | - | x | x |
| Small FTD | x | x | - | x | - | x | x | - | - | x | x | x |
| Large FTD | - | - | x | - | x | - | - | x | x | - | - | - |

Variations table for Front Board

| ITEM NO. | A5272 | A5273 | A5274 | A5275 | A5276 | A5277 | A5307 | A5308 | A5344 | A5348 | A5350 | A5365 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DM21 | x | x | - | - | - | - | x | - | - | x | - | - |
| DM23 | - | - | - | - | - | - | - | - | x | - | x | - |
| DM26 | x | x | x | x | - | - | x | x | x | x | x | x |
| DM27 | - | - | - | - | x | x | - | - | - | - | - | - |
| 1402 | - | - | x | - | x | - | - | x | x | - | - | - |
| 1403 | x | x | - | x | - | x | x | - | - | x | x | x |
| 1404 | x | x | x | x | x | x | x | x | - | x | - | x |
| 1405 | - | - | x | x | x | x | - | x | x | - | x | x |
| 1418 | - | - | x | - | x | - | - | x | x | - | - | - |
| 1419 | - | - | x | - | x | - | - | x | x | - | - | - |
| 1420 | - | - | x | - | x | - | - | x | x | - | - | - |
| 1421 | - | - | x | x | x | x | - | x | x | - | x | x |
| 1423 | - | - | x | x | x | x | - | x | x | - | x | x |
| 1425 | - | - | - | x | x | x | - | - | x | - | x | - |
| 1426 | - | - | x | x | x | x | - | x | x | - | x | x |
| 1427 | - | - | - | - | x | x | - | - | x | - | x | - |
| 1428 | x | - | - | - | - | - | - | - | - | x | - | - |
| 1429 | x | - | - | - | - | - | - | - | - | x | - | - |
| 1430 | x | - | - | x | - | x | - | - | - | x | x | x |
| 2417 | - | 220µF | 220µF | 220µF | 220µF | 220µF | 220µF | 220µF | 220µF | - | 220µF | 220µF |
| 2421 | 2,2µF | 22µF | 22µF | 22µF | 22µF | 22µF | 22µF | 22µF | 22µF | 2,2µF | 22µF | 22µF |
| 2432 | - | - | - | - | 100pF | 100pF | - | - | - | - | - | - |
| 2433 | - | - | - | - | 47pF | 47pF | - | - | - | - | - | - |
| 2462 | - | 220nF | 220nF | 220nF | 220nF | 220nF | 220nF | 220nF | 220nF | - | 220nF | 220nF |

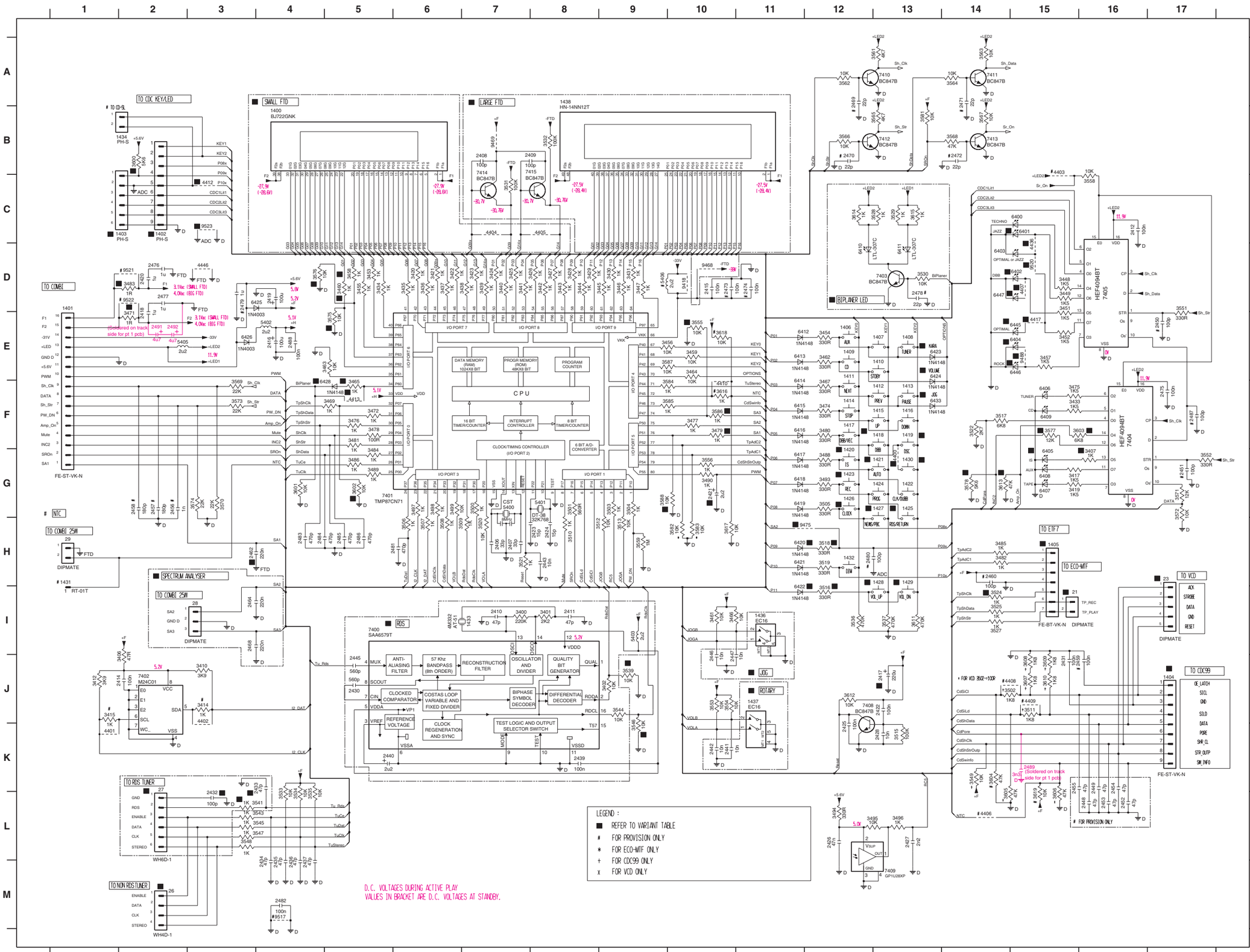
6-3

| ITEM NO. | A5272 | A5273 | A5274 | A5275 | A5276 | A5277 | A5307 | A5308 | A5344 | A5348 | A5350 | A5365 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3407 | - | - | 1k | - | 1k | - | - | 1k | 1k | - | - | - |
| 3458 | - | - | 1k | - | 1k | - | - | 1k | 1k | - | - | - |
| 3460 | - | - | 1k | - | 1k | - | - | 1k | 1k | - | - | - |
| 3465 | - | 1k | 1k | 1k | 1k | 1k | 1k | 1k | 1k | - | 1k | 1k |
| 3471 | 4R7 | 4R7 | 1R | 4R7 | 1R | 4R7 | 4R7 | 1R | 1R | 4R7 | 4R7 | 4R7 |
| 3479 | - | 1k | 1k | 1k | 1k | 1k | 1k | 1k | 1k | - | 1k | 1k |
| 3483 | 4R7 | 4R7 | 1R | 4R7 | 1R | 4R7 | 4R7 | 1R | 1R | 4R7 | 4R7 | 4R7 |
| 3516 | 330R | - | - | - | - | - | - | - | - | 330R | - | - |
| 3518 | - | - | 330R | - | 330R | - | - | 330R | 330R | - | - | - |
| 3524 | - | - | 1k | 1k | 1k | 1k | - | 1k | 1k | - | 1k | 1k |
| 3539 | 10k | 10k | 10k | 10k | - | - | 10k | 10k | 10k | 10k | 10k | 10k |
| 3541 | - | - | - | - | 1k | 1k | - | - | - | - | - | - |
| 3546 | 10k | 10k | 10k | 10k | - | - | 10k | 10k | 10k | 10k | 10k | 10k |
| 3555 | 10k | 10k | - | 10k | - | 10k | 10k | - | - | 10k | 10k | 10k |
| 3575 | 10k | 10k | - | 10k | - | 10k | 10k | - | - | 10k | 10k | 10k |
| 3576 | 10k | 10k | - | 10k | - | 10k | 10k | - | - | 10k | 10k | 10k |
| 3577 | - | - | 12k | - | 12k | - | - | 12k | 12k | - | - | - |
| 3578 | - | - | 5k6 | - | 5k6 | - | - | 5k6 | 5k6 | - | - | - |
| 3586 | - | - | 1k | - | 1k | - | - | 1k | 1k | - | - | - |
| 3588 | 10k | - | - | - | - | - | - | - | - | 10k | - | - |
| 3600 | 5k6 | 5k6 | - | 5k6 | - | 5k6 | 5k6 | - | - | 5k6 | 5k6 | 5k6 |
| 3602 | 10k | 10k | - | - | - | - | 10k | - | - | 10k | - | - |
| 3603 | 6k8 | 10k | 10k | 10k | 10k | 10k | 10k | 10k | 10k | 6k8 | 10k | 10k |
| 3613 | 47k | 12k | 12k | 12k | 12k | 12k | 12k | 12k | 12k | 47k | 12k | 12k |
| 4400 | x | - | - | x | - | x | - | - | - | x | x | x |
| 4407 | x | x | - | x | - | x | x | - | - | x | x | x |
| 4412 | - | - | x | - | x | - | - | x | x | - | - | - |
| 4413 | x | - | - | - | - | - | - | - | - | x | - | - |
| 4417 | x | - | - | x | - | x | - | - | - | x | x | x |
| 4436 | x | - | - | x | - | x | - | - | - | x | x | x |
| 6401 | - | x | x | - | x | - | x | x | x | - | - | - |
| 6402 | - | - | x | - | x | - | - | x | x | - | - | - |
| 6404 | - | x | x | - | x | - | x | x | x | - | - | - |
| 6405 | - | - | x | - | x | - | - | x | x | - | - | - |
| 6420 | - | - | x | - | x | - | - | x | x | | - | |
| 6422 | x | - | - | - | - | - | - | - | - | x | - | - |
| 6423 | - | - | x | x | - | - | x | - | x | x | - | - |
| 6424 | - | x | - | - | - | - | x | - | - | - | - | - |
| 6428 | - | x | x | x | x | x | x | x | x | - | x | x |
| 6433 | - | x | - | - | - | - | x | - | - | - | - | - |
| 6445 | x | - | - | x | - | x | - | - | - | x | x | x |
| 6446 | x | - | - | x | - | x | - | - | - | x | x | x |
| 6447 | x | x | - | x | - | x | x | - | - | x | x | x |
| 9475 | x | x | - | x | - | x | x | - | - | x | x | x |
| 9488 | - | x | x | - | x | - | x | x | x | - | - | - |
| 9520 | - | x | x | - | x | - | x | x | x | - | - | - |
| 9523 | x | x | - | x | - | x | x | - | - | x | x | x |
| | | | | | | | | | | | | |

x = Item in use.

6-4

# CIRCUIT DIAGRAM

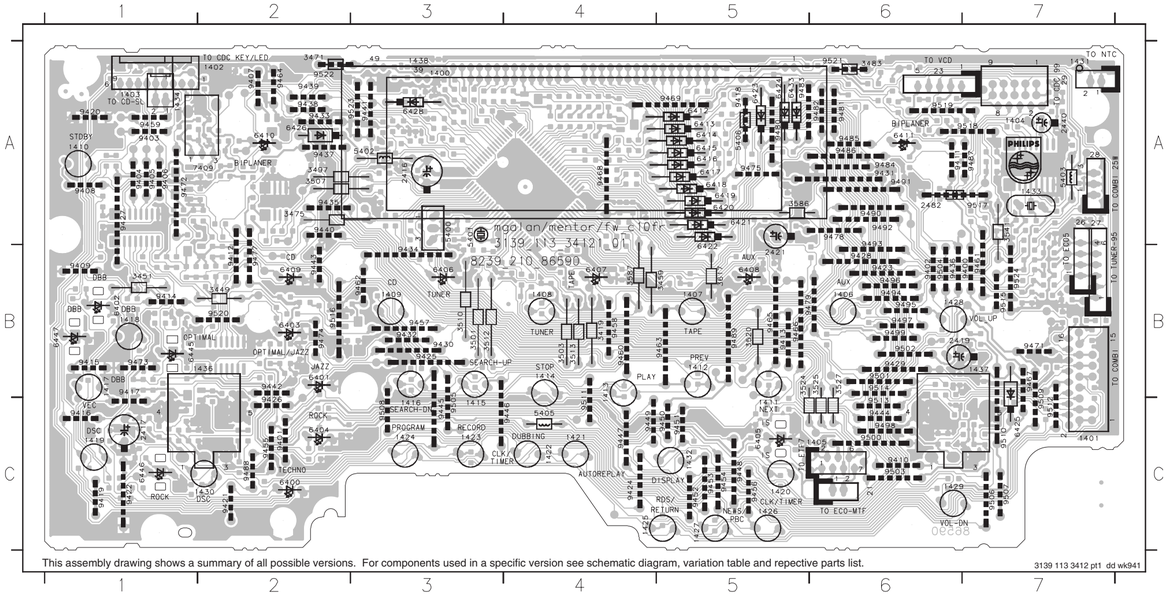




21 I15 23 H17 26 M2 27 K2 28 I3 29 H1 1400 B4 1401 D1 1402 C2 1403 C1 1404 J17 1405 H15 1406 E12 1407 E13 1408 E13 1409 E12 1410 E13 1411 E12 1412 F13 1413 F13 1414 F12 1415 F13 1416 F13 1417 F12 1418 F13 1419 F13 1420 G12 1421 G13 1422 G13 1423 G12 1424 G13 1425 G13 1426 G13 1427 G13 1428 H13 1429 H13 1430 G13 1431 H1 1432 H12 1433 I7 1434 B1 1436 I11 1437 J11 1438 A8 2406 H7 2407 H7 2408 B7 2409 B8 2410 I7 2411 I8 2412 C16 2414 J2 2415 D10 2416 E4 2417 J13 2418 E2 2419 D4 2420 D2 2421 K10 2422 J13 2423 H8 2424 H8 2425 K12 2426 L12 2427 L13 2428 K13 2430 J5 2431 J15 2432 L3 2433 K3 2434 M4 2435 M4 2436 M4 2437 M4 2439 K8 2440 K5 2441 K10 2442 K10 2443 H8 2445 J5 2446 J10 2447 J10 2448 L16 2449 K16 2450 E17 2451 G17 2452 L16 2453 L16 2454 K16 2455 K15 2456 G2 2457 G2 2458 G2 2459 J15 2460 H14 2462 H3 2464 I3 2468 I3 2469 A12 2470 B12 2471 A14 2472 B14 2473 D10 2474 D11 2475 F17 2476 D2 2477 D2 2478 D13 2479 D3 2480 H12 2481 H6 2482 M4 2483 H4 2484 H4 2485 H5 2486 H5 2487 F17 2488 E4 2489 K15 3400 I7 3401 I8 3402 J9 3406 J2 3407 G16 3410 J3 3412 J1 3414 J3 3415 J1 3417 G15 3419 G15 3420 D6 3421 D6 3422 D6 3423 D7 3424 D7 3425 D7 3426 D8 3427 D8 3428 D8 3429 D8 3430 D9 3431 D9 3433 F15 3434 D5 3435 D6 3436 D6 3437 D6 3438 D7 3439 D7 3440 D7 3441 D7 3442 D8 3443 D8 3444 D8 3445 D9 3446 D9 3447 D9 3448 D15 3449 D15 3451 D15 3452 E15 3453 D5 3454 E12 3455 D5 3456 E10 3457 E15 3458 D5 3459 E10 3460 D5 3461 I10 3462 E12 3463 E5 3464 E10 3465 F5 3466 I10 3467 F12 3469 F5 3471 E2 3472 F5 3474 F12 3475 F15 3476 F5 3477 F10 3478 F5 3479 F10 3480 H11 3481 F5 3482 F12 3483 D2 3484 G5 3485 H14 3486 G5 3488 G12 3489 G5 3490 G10 3493 G12 3494 L12 3495 L12 3496 L13 3497 G6 3498 G6 3499 G6 3500 G7 3501 G8 3502 J15 3503 G9 3504 G9 3505 G12 3506 H6 3507 H6 3508 H6 3509 G6 3510 H8 3511 J15 3512 H8 3513 H9 3514 H12 3515 H12 3517 F14 3518 H12 3519 H12 3520 H7 3521 H7 3522 F14 3523 H7 3524 H12 3525 H12 3527 H14 3530 D13 3531 C7 3532 B8 3533 L4 3534 L4 3535 L4 3536 I12 3537 I13 3538 J9 3539 J9 3541 L4 3543 L4 3544 J9 3545 L4 3546 K9 3547 L4 3548 L3 3549 K14 3551 D17 3552 G17 3553 J10 3554 J10 3555 E10 3556 G10 3558 C16 3559 H9 3561 A13 3562 A12 3563 A14 3564 A14 3565 B13 3566 B12 3567 B14 3568 B14 3569 F3 3570 G3 3571 G17 3572 G17 3573 F3 3574 G3 3575 E5 3576 D4 3577 F15 3578 G14 3581 B13 3583 H10 3584 F10 3585 F10 3586 F10 3587 E10 3588 G9 3589 B2 3600 B2 3601 G4 3602 G5 3603 F16 3604 K14 3605 L14 3606 L15 3607 J15 3608 J15 3609 J15 3610 J15 3611 I13 3612 J12 3613 G14 3614 C12 3615 C13 3616 F10 3617 H10 3618 E10 3619 L15 4400 G13 4401 K1 4402 J3 4403 B15 4404 C7 4405 C8 4406 L14 4407 D15 4408 J15 4409 J15 4410 F10 4412 C3 4413 F5 4417 E15 4436 D15 4446 D3 5400 G7 5401 G8 5402 E4 5403 I9

## COMPONENT LAYOUT





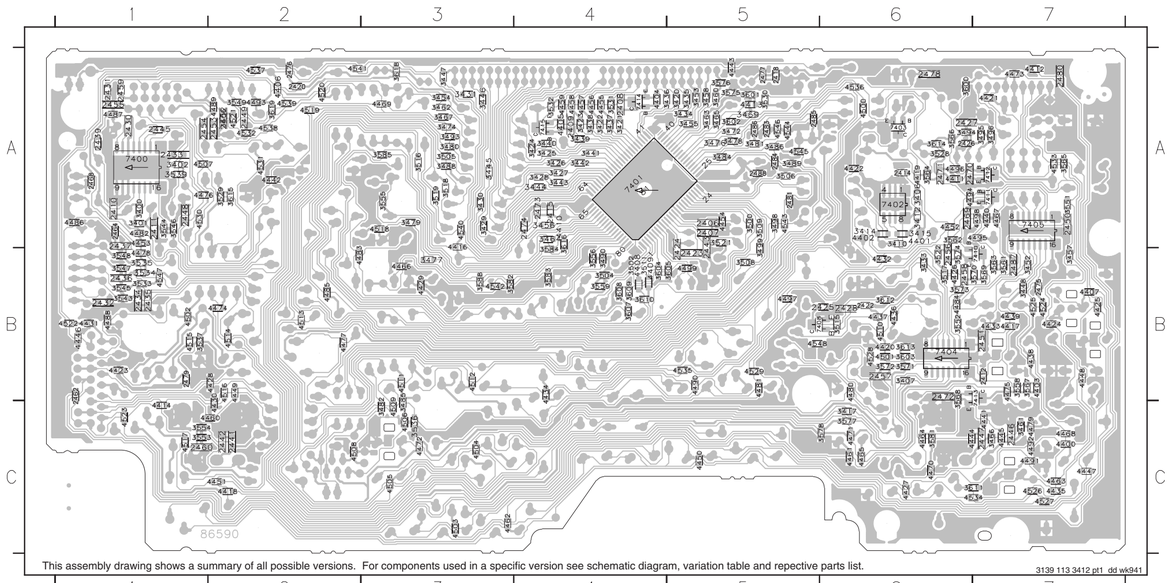

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram, variation table and repective parts list.

3139 113 3412.pt1 dd wk941



## CHIP LAYOUT






This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram, variation table and repective parts list.

3139 113 3412.pt1 dd wk941

## ELECTRICAL PARTS LIST - FRONT BOARD

### MISCELLANEOUS

| | | |
|---|---|---|
| 1401 | 242202514546 | Flex Socket 16pin Hort, |
| 1404 | 482226511531 | Flex Socket 9pin Hort, |
| 1405 | 482226710953 | Flex Socket 7pin Vert, |
| 1406 | 482227613775 | Tact Switch |
| 1407 | 482227613775 | Tact Switch |
| 1408 | 482227613775 | Tact Switch |
| 1409 | 482227613775 | Tact Switch |
| 1410 | 482227613775 | Tact Switch |
| 1411 | 482227613775 | Tact Switch |
| 1412 | 482227613775 | Tact Switch |
| 1413 | 482227613775 | Tact Switch |
| 1414 | 482227613775 | Tact Switch |
| 1415 | 482227613775 | Tact Switch |
| 1416 | 482227613775 | Tact Switch |
| 1417 | 482227613775 | Tact Switch |
| 1418 | 482227613775 | Tact Switch |
| 1419 | 482227613775 | Tact Switch |
| 1420 | 482227613775 | Tact Switch |
| 1421 | 482227613775 | Tact Switch |
| 1422 | 482227613775 | Tact Switch |
| 1423 | 482227613775 | Tact Switch |
| 1424 | 482227613775 | Tact Switch |
| 1425 | 482227613775 | Tact Switch |
| 1426 | 482227613775 | Tact Switch |
| 1427 | 482227613775 | Tact Switch |
| 1432 | 482227613775 | Tact Switch |
| 1433 | 482224272195 | Quartz 4,332MHz |
| 1436 | 482227310366 | Rotary Encoder 24P Jog |
| 1437 | 482227310365 | Rotary Encoder 24P Volume |
| 1438 | 313911052090 | FTD Display HNA-14NN12T |

### CAPACITORS

| | | |
|---|---|---|
| 2406 | 532212232659 | 33pF 5% 50V |
| 2407 | 532212232659 | 33pF 5% 50V |
| 2408 | 532212232531 | 100pF 5% 50V |
| 2409 | 532212232531 | 100pF 5% 50V |
| 2410 | 482212613692 | 47pF 1% 63V |
| 2411 | 482212613692 | 47pF 1% 63V |
| 2412 | 482212614585 | 100nF 10% 50V |
| 2414 | 482212613838 | 100nF +80/-20% 50V |
| 2415 | 482212614585 | 100nF 10% 50V |
| 2416 | 482212423432 | 100µF 20% 10V |
| 2417 | 482212412245 | 220µF 20% 10V |
| 2418 | 482212614043 | 1µF +80/-20% 16V |
| 2419 | 482212441584 | 100µF 20% 10V |
| 2420 | 482212614043 | 1µF +80/-20% 16V |
| 2421 | 482212481151 | 22µF 50V |
| 2422 | 482212614585 | 100nF 10% 50V |
| 2423 | 482212613486 | 15pF 2% 63V |
| 2424 | 482212613486 | 15pF 2% 63V |
| 2425 | 482212613838 | 100nF +80/-20% 50V |
| 2426 | 482212613751 | 47nF 10% 63V |
| 2427 | 482212233127 | 2,2nF 10% 63V |
| 2428 | 482212233177 | 10nF 20% 50V |
| 2430 | 532211680853 | 560pF 5% 63V |
| 2431 | 482212614585 | 100nF 10% 50V |
| 2432 | 532212232531 | 100pF 5% 50V |
| 2433 | 482212613692 | 47pF 1% 63V |
| 2434 | 482212613692 | 47pF 1% 63V |
| 2435 | 482212613692 | 47pF 1% 63V |
| 2436 | 482212613692 | 47pF 1% 63V |
| 2437 | 482212613692 | 47pF 1% 63V |
| 2439 | 482212614585 | 100nF 10% 50V |
| 2440 | 482212422652 | 2,2µF 20% 50V |
| 2441 | 482212233177 | 10nF 20% 50V |
| 2442 | 482212233177 | 10nF 20% 50V |
| 2443 | 482212233177 | 10nF 20% 50V |
| 2445 | 532211680853 | 560pF 5% 63V |
| 2446 | 482212233177 | 10nF 20% 50V |
| 2447 | 482212233177 | 10nF 20% 50V |
| 2462 | 482212614076 | 220nF +80/-20% 25V |
| 2464 | 482212614076 | 220nF +80/-20% 25V |
| 2468 | 482212614076 | 220nF +80/-20% 25V |
| 2475 | 482212614585 | 100nF 10% 50V |
| 2476 | 482212614043 | 1µF +80/-20% 16V |
| 2477 | 482212614043 | 1µF +80/-20% 16V |
| 2481 | 532212232268 | 470pF 10% 50V |
| 2482 | 482212612882 | 100nF +80/-20% 50V |
| 2483 | 532212232268 | 470pF 10% 50V |
| 2484 | 532212232268 | 470pF 10% 50V |
| 2485 | 532212232268 | 470pF 10% 50V |
| 2486 | 532212232268 | 470pF 10% 50V |
| 2488 | 482212614585 | 100nF 10% 50V |
| 2489 | 482212210577 | 3,3nF 10% 16V |
| 2491 | 482212440769 | 4,7µF 20% 50V |
| 2492 | 482212440769 | 4,7µF 20% 50V |

### RESISTORS

| | | |
|---|---|---|
| 3400 | 482211713579 | 220k 1% 0,1W |
| 3401 | 482211711449 | 2k2 1% 0,1W |
| 3402 | 482211710833 | 10k 1% 0,1W |
| 3406 | 482205120479 | 47R 5% 0,1W |
| 3407 | 482205110102 | 1k 2% 0,25W |
| 3410 | 482205120392 | 3k9 5% 0,1W |
| 3412 | 482205120392 | 3k9 5% 0,1W |
| 3417 | 482211711139 | 1k5 1% 0,1W |
| 3419 | 482211652243 | 1k5 5% 0,5W |
| 3420 | 482205110102 | 1k 2% 0,25W |
| 3421 | 482205110102 | 1k 2% 0,25W |
| 3422 | 482205110102 | 1k 2% 0,25W |
| 3423 | 482205110102 | 1k 2% 0,25W |
| 3424 | 482205110102 | 1k 2% 0,25W |
| 3425 | 482205110102 | 1k 2% 0,25W |
| 3426 | 482205110102 | 1k 2% 0,25W |
| 3427 | 482205110102 | 1k 2% 0,25W |
| 3428 | 482205110102 | 1k 2% 0,25W |
| 3429 | 482205110102 | 1k 2% 0,25W |
| 3430 | 482205110102 | 1k 2% 0,25W |
| 3431 | 482205110102 | 1k 2% 0,25W |
| 3433 | 482211711139 | 1k5 1% 0,1W |
| 3434 | 482205110102 | 1k 2% 0,25W |
| 3435 | 482205110102 | 1k 2% 0,25W |
| 3436 | 482205110102 | 1k 2% 0,25W |
| 3437 | 482205110102 | 1k 2% 0,25W |
| 3438 | 482205110102 | 1k 2% 0,25W |
| 3439 | 482205110102 | 1k 2% 0,25W |
| 3440 | 482205110102 | 1k 2% 0,25W |
| 3441 | 482205110102 | 1k 2% 0,25W |
| 3442 | 482205110102 | 1k 2% 0,25W |
| 3443 | 482205110102 | 1k 2% 0,25W |
| 3444 | 482205110102 | 1k 2% 0,25W |
| 3445 | 482205110102 | 1k 2% 0,25W |
| 3446 | 482205110102 | 1k 2% 0,25W |
| 3447 | 482205110102 | 1k 2% 0,25W |
| 3448 | 482211711139 | 1k5 1% 0,1W |
| 3449 | 482211652243 | 1k5 5% 0,5W |
| 3451 | 482211652243 | 1k5 5% 0,5W |
| 3452 | 482211711139 | 1k5 1% 0,1W |
| 3453 | 482205110102 | 1k 2% 0,25W |
| 3454 | 482211713577 | 330R 1% 0,1W |
| 3455 | 482205110102 | 1k 2% 0,25W |
| 3456 | 482211710833 | 10k 1% 0,1W |
| 3457 | 482211711139 | 1k5 1% 0,1W |
| 3458 | 482205110102 | 1k 2% 0,25W |
| 3459 | 482205021003 | 10k 1% 0,6W |
| 3460 | 482205110102 | 1k 2% 0,25W |
| 3461 | 482211710833 | 10k 1% 0,1W |
| 3462 | 482211713577 | 330R 1% 0,1W |
| 3463 | 482211710833 | 10k 1% 0,1W |
| 3464 | 482211710833 | 10k 1% 0,1W |
| 3465 | 482205110102 | 1k 2% 0,25W |
| 3466 | 482211710833 | 10k 1% 0,1W |
| 3467 | 482211713577 | 330R 1% 0,1W |
| 3469 | 482205110102 | 1k 2% 0,25W |
| 3471 | 482211680176 | 1R 5% 0,5W |
| 3472 | 482205110102 | 1k 2% 0,25W |
| 3474 | 482211713577 | 330R 1% 0,1W |
| 3475 | 482211652243 | 1k5 5% 0,5W |
| 3476 | 482205110102 | 1k 2% 0,25W |
| 3477 | 482205110102 | 1k 2% 0,25W |
| 3478 | 482205120101 | 100R 5% 0,1W |
| 3479 | 482205110102 | 1k 2% 0,25W |
| 3480 | 482211713577 | 330R 1% 0,1W |
| 3481 | 482205110102 | 1k 2% 0,25W |
| 3482 | 482205110102 | 1k 2% 0,25W |
| 3483 | 482211680176 | 1R 5% 0,5W |
| 3484 | 482205110102 | 1k 2% 0,25W |
| 3485 | 482205110102 | 1k 2% 0,25W |
| 3486 | 482205110102 | 1k 2% 0,25W |
| 3488 | 482211713577 | 330R 1% 0,1W |
| 3489 | 482205110102 | 1k 2% 0,25W |
| 3490 | 482205110102 | 1k 2% 0,25W |
| 3493 | 482211713577 | 330R 1% 0,1W |
| 3494 | 482211713577 | 330R 1% 0,1W |
| 3495 | 482211710833 | 10k 1% 0,1W |
| 3496 | 482205110102 | 1k 2% 0,25W |
| 3497 | 482205011002 | 1k 1% 0,4W |
| 3498 | 482205110102 | 1k 2% 0,25W |
| 3499 | 482211710833 | 10k 1% 0,1W |
| 3500 | 482205110102 | 1k 2% 0,25W |
| 3501 | 482211652226 | 560R 5% 0,5W |
| 3502 | 482205120182 | 1k8 5% 0,1W |
| 3503 | 482205011002 | 1k 1% 0,4W |
| 3504 | 482205110102 | 1k 2% 0,25W |
| 3505 | 482211713577 | 330R 1% 0,1W |
| 3506 | 482205110102 | 1k 2% 0,25W |
| 3507 | 482205011002 | 1k 1% 0,4W |
| 3508 | 482205110102 | 1k 2% 0,25W |
| 3509 | 482205110102 | 1k 2% 0,25W |
| 3510 | 482205011002 | 1k 1% 0,4W |
| 3511 | 482205120182 | 1k8 5% 0,1W |
| 3512 | 482205021003 | 10k 1% 0,6W |
| 3513 | 482205021003 | 10k 1% 0,6W |
| 3515 | 482211710837 | 100k 1% 0,1W |
| 3517 | 482211711507 | 6k8 1% 0,1W |
| 3518 | 482211713577 | 330R 1% 0,1W |
| 3519 | 482211713577 | 330R 1% 0,1W |
| 3520 | 482205021003 | 10k 1% 0,6W |
| 3521 | 482205110102 | 1k 2% 0,25W |
| 3522 | 482211712955 | 2k7 1% 0,1W |
| 3524 | 482205011002 | 1k 1% 0,4W |
| 3525 | 482205011002 | 1k 1% 0,4W |
| 3527 | 482205011002 | 1k 1% 0,4W |
| 3528 | 482205110102 | 1k 2% 0,25W |
| 3529 | 482205110102 | 1k 2% 0,25W |
| 3530 | 482211710833 | 10k 1% 0,1W |
| 3531 | 482211710837 | 100k 1% 0,1W |
| 3532 | 482211710837 | 100k 1% 0,1W |
| 3533 | 482211710833 | 10k 1% 0,1W |
| 3534 | 482211710833 | 10k 1% 0,1W |
| 3535 | 482211710833 | 10k 1% 0,1W |
| 3536 | 482205120474 | 470k 5% 0,1W |
| 3537 | 482205120474 | 470k 5% 0,1W |
| 3539 | 482211710833 | 10k 1% 0,1W |
| 3541 | 482205011002 | 1k 1% 0,4W |
| 3543 | 482205110102 | 1k 2% 0,25W |
| 3544 | 482211710833 | 10k 1% 0,1W |
| 3545 | 482205110102 | 1k 2% 0,25W |
| 3546 | 482211710833 | 10k 1% 0,1W |
| 3547 | 482205110102 | 1k 2% 0,25W |
| 3548 | 482205110102 | 1k 2% 0,25W |
| 3549 | 482211710833 | 10k 1% 0,1W |
| 3551 | 482211713577 | 330R 1% 0,1W |
| 3552 | 482211713577 | 330R 1% 0,1W |
| 3553 | 482211710833 | 10k 1% 0,1W |
| 3554 | 482211710833 | 10k 1% 0,1W |
| 3556 | 482205110102 | 1k 2% 0,25W |
| 3558 | 482211710833 | 10k 1% 0,1W |
| 3559 | 482205120105 | 1M 5% 0,1W |
| 3561 | 482205120472 | 4k7 5% 0,1W |
| 3562 | 482211710833 | 10k 1% 0,1W |
| 3563 | 482211710833 | 10k 1% 0,1W |
| 3564 | 482211710833 | 10k 1% 0,1W |
| 3565 | 482205120472 | 4k7 5% 0,1W |
| 3566 | 482211710833 | 10k 1% 0,1W |
| 3567 | 482211710833 | 10k 1% 0,1W |
| 3568 | 482211710834 | 47k 1% 0,1W |
| 3569 | 482205120223 | 22k 5% 0,1W |
| 3570 | 482205120223 | 22k 5% 0,1W |
| 3571 | 482211711383 | 12k 1% 0,1W |
| 3572 | 482211710833 | 10k 1% 0,1W |
| 3573 | 482205120223 | 22k 5% 0,1W |
| 3574 | 482205120223 | 22k 5% 0,1W |
| 3577 | 482211711383 | 12k 1% 0,1W |
| 3578 | 482205120562 | 5k6 5% 0,1W |
| 3581 | 482211710833 | 10k 1% 0,1W |
| 3584 | 482205110102 | 1k 2% 0,25W |
| 3585 | 482205110102 | 1k 2% 0,25W |
| 3586 | 482205011002 | 1k 1% 0,4W |
| 3587 | 482205021003 | 10k 1% 0,6W |
| 3601 | 482211710833 | 10k 1% 0,1W |
| 3603 | 482211710833 | 10k 1% 0,1W |
| 3607 | 482205120182 | 1k8 5% 0,1W |
| 3608 | 482205120182 | 1k8 5% 0,1W |
| 3609 | 482205120182 | 1k8 5% 0,1W |
| 3610 | 482205120182 | 1k8 5% 0,1W |
| 3611 | 482205120474 | 470k 5% 0,1W |
| 3612 | 482211710833 | 10k 1% 0,1W |
| 3613 | 482211711383 | 12k 1% 0,1W |
| 3614 | 482205110102 | 1k 2% 0,25W |
| 3615 | 482205110102 | 1k 2% 0,25W |
| 3617 | 482205021003 | 10k 1% 0,6W |
| 4401 | 482205120008 | 0R Jumper 0805 |
| 4402 | 482205120008 | 0R Jumper 0805 |
| 4410 | 482205120008 | 0R Jumper 0805 |
| 4411 | 482205120008 | 0R Jumper 0805 |
| 4412 | 482205120008 | 0R Jumper 0805 |
| 4414 | 482205120008 | 0R Jumper 0805 |
| 4416 | 482205120008 | 0R Jumper 0805 |
| 4418 | 482205120008 | 0R Jumper 0805 |
| 4419 | 482205120008 | 0R Jumper 0805 |
| 4420 | 482205120008 | 0R Jumper 0805 |
| 4421 | 482205120008 | 0R Jumper 0805 |
| 4422 | 482205120008 | 0R Jumper 0805 |
| 4423 | 482205120008 | 0R Jumper 0805 |
| 4424 | 482205120008 | 0R Jumper 0805 |
| 4425 | 482205120008 | 0R Jumper 0805 |
| 4426 | 482205120008 | 0R Jumper 0805 |
| 4427 | 482205120008 | 0R Jumper 0805 |
| 4428 | 482205120008 | 0R Jumper 0805 |
| 4429 | 482205120008 | 0R Jumper 0805 |
| 4430 | 482205120008 | 0R Jumper 0805 |
| 4431 | 482205120008 | 0R Jumper 0805 |
| 4432 | 482205120008 | 0R Jumper 0805 |
| 4433 | 482205120008 | 0R Jumper 0805 |
| 4434 | 482205120008 | 0R Jumper 0805 |
| 4435 | 482205120008 | 0R Jumper 0805 |
| 4437 | 482205120008 | 0R Jumper 0805 |
| 4438 | 482205120008 | 0R Jumper 0805 |
| 4439 | 482205120008 | 0R Jumper 0805 |
| 4440 | 482205120008 | 0R Jumper 0805 |
| 4441 | 482205120008 | 0R Jumper 0805 |
| 4442 | 482205120008 | 0R Jumper 0805 |
| 4443 | 482205120008 | 0R Jumper 0805 |
| 4444 | 482205120008 | 0R Jumper 0805 |
| 4445 | 482205120008 | 0R Jumper 0805 |
| 4446 | 482205120008 | 0R Jumper 0805 |
| 4447 | 482205120008 | 0R Jumper 0805 |
| 4448 | 482205120008 | 0R Jumper 0805 |
| 4449 | 482205120008 | 0R Jumper 0805 |
| 4450 | 482205120008 | 0R Jumper 0805 |
| 4451 | 482205120008 | 0R Jumper 0805 |
| 4452 | 482205120008 | 0R Jumper 0805 |
| 4453 | 482205120008 | 0R Jumper 0805 |
| 4454 | 482205120008 | 0R Jumper 0805 |
| 4455 | 482205120008 | 0R Jumper 0805 |
| 4456 | 482205120008 | 0R Jumper 0805 |
| 4457 | 482205120008 | 0R Jumper 0805 |
| 4458 | 482205120008 | 0R Jumper 0805 |
| 4459 | 482205120008 | 0R Jumper 0805 |
| 4460 | 482205120008 | 0R Jumper 0805 |
| 4461 | 482205120008 | 0R Jumper 0805 |
| 4462 | 482205120008 | 0R Jumper 0805 |
| 4463 | 482205120008 | 0R Jumper 0805 |
| 4464 | 482205120008 | 0R Jumper 0805 |
| 4465 | 482205120008 | 0R Jumper 0805 |
| 4466 | 482205120008 | 0R Jumper 0805 |
| 4467 | 482205120008 | 0R Jumper 0805 |
| 4468 | 482205120008 | 0R Jumper 0805 |
| 4469 | 482205120008 | 0R Jumper 0805 |
| 4470 | 482205120008 | 0R Jumper 0805 |
| 4471 | 482205120008 | 0R Jumper 0805 |

## *ELECTRICAL PARTS LIST - FRONT BOARD*

### RESISTORS

| | | |
|---|---|---|
| 4472 | 482205120008 | 0R Jumper 0805 |
| 4473 | 482205120008 | 0R Jumper 0805 |
| 4474 | 482205120008 | 0R Jumper 0805 |
| 4475 | 482205120008 | 0R Jumper 0805 |
| 4476 | 482205120008 | 0R Jumper 0805 |
| 4477 | 482205120008 | 0R Jumper 0805 |
| 4478 | 482205120008 | 0R Jumper 0805 |
| 4479 | 482205120008 | 0R Jumper 0805 |
| 4480 | 482205120008 | 0R Jumper 0805 |
| 4481 | 482205120008 | 0R Jumper 0805 |
| 4482 | 482205120008 | 0R Jumper 0805 |
| 4483 | 482205120008 | 0R Jumper 0805 |
| 4484 | 482205120008 | 0R Jumper 0805 |
| 4485 | 482205120008 | 0R Jumper 0805 |
| 4486 | 482205120008 | 0R Jumper 0805 |
| 4487 | 482205120008 | 0R Jumper 0805 |
| 4488 | 482205120008 | 0R Jumper 0805 |
| 4489 | 482205120008 | 0R Jumper 0805 |
| 4490 | 482205120008 | 0R Jumper 0805 |
| 4491 | 482205120008 | 0R Jumper 0805 |
| 4492 | 482205120008 | 0R Jumper 0805 |
| 4493 | 482205120008 | 0R Jumper 0805 |
| 4494 | 482205120008 | 0R Jumper 0805 |
| 4495 | 482205120008 | 0R Jumper 0805 |
| 4496 | 482205120008 | 0R Jumper 0805 |
| 4497 | 482205120008 | 0R Jumper 0805 |
| 4498 | 482205120008 | 0R Jumper 0805 |
| 4499 | 482205120008 | 0R Jumper 0805 |
| 4500 | 482205120008 | 0R Jumper 0805 |
| 4501 | 482205120008 | 0R Jumper 0805 |
| 4502 | 482205120008 | 0R Jumper 0805 |
| 4503 | 482205120008 | 0R Jumper 0805 |
| 4504 | 482205120008 | 0R Jumper 0805 |
| 4505 | 482205120008 | 0R Jumper 0805 |
| 4506 | 482205120008 | 0R Jumper 0805 |
| 4507 | 482205120008 | 0R Jumper 0805 |
| 4508 | 482205120008 | 0R Jumper 0805 |
| 4509 | 482205120008 | 0R Jumper 0805 |
| 4510 | 482205120008 | 0R Jumper 0805 |
| 4511 | 482205120008 | 0R Jumper 0805 |
| 4512 | 482205120008 | 0R Jumper 0805 |
| 4513 | 482205120008 | 0R Jumper 0805 |
| 4514 | 482205120008 | 0R Jumper 0805 |
| 4515 | 482205120008 | 0R Jumper 0805 |
| 4516 | 482205120008 | 0R Jumper 0805 |
| 4517 | 482205120008 | 0R Jumper 0805 |
| 4518 | 482205120008 | 0R Jumper 0805 |
| 4519 | 482205120008 | 0R Jumper 0805 |
| 4520 | 482205120008 | 0R Jumper 0805 |
| 4521 | 482205120008 | 0R Jumper 0805 |
| 4522 | 482205120008 | 0R Jumper 0805 |
| 4523 | 482205120008 | 0R Jumper 0805 |
| 4524 | 482205120008 | 0R Jumper 0805 |
| 4525 | 482205120008 | 0R Jumper 0805 |
| 4526 | 482205120008 | 0R Jumper 0805 |
| 4527 | 482205120008 | 0R Jumper 0805 |
| 4528 | 482205120008 | 0R Jumper 0805 |
| 4529 | 482205120008 | 0R Jumper 0805 |
| 4530 | 482205120008 | 0R Jumper 0805 |
| 4531 | 482205120008 | 0R Jumper 0805 |
| 4532 | 482205120008 | 0R Jumper 0805 |
| 4533 | 482205120008 | 0R Jumper 0805 |
| 4534 | 482205120008 | 0R Jumper 0805 |
| 4535 | 482205120008 | 0R Jumper 0805 |
| 4536 | 482205120008 | 0R Jumper 0805 |
| 4537 | 482205120008 | 0R Jumper 0805 |
| 4538 | 482205120008 | 0R Jumper 0805 |
| 4539 | 482205120008 | 0R Jumper 0805 |
| 4540 | 482205120008 | 0R Jumper 0805 |
| 4541 | 482205120008 | 0R Jumper 0805 |
| 4542 | 482205120008 | 0R Jumper 0805 |
| 4543 | 482205120008 | 0R Jumper 0805 |
| 4544 | 482205120008 | 0R Jumper 0805 |
| 4545 | 482205120008 | 0R Jumper 0805 |
| 4546 | 482205120008 | 0R Jumper 0805 |
| 4547 | 482205120008 | 0R Jumper 0805 |
| 4548 | 482205120008 | 0R Jumper 0805 |

### COILS & FILTERS

| | | |
|---|---|---|
| 5400 | 482224272066 | Ceram Resonator 8MHz |
| 5401 | 242254301069 | X'tal Resonator 32,768kHz |
| 5402 | 482215762552 | Coil 2,2µH 5% |
| 5403 | 482215762552 | Coil 2,2µH 5% |
| 5405 | 482215762552 | Coil 2,2µH 5% |

### DIODES

| | | |
|---|---|---|
| 6400 | 482213082978 | LTL-1CHPE |
| 6401 | 482213082978 | LTL-1CHPE |
| 6402 | 482213082978 | LTL-1CHPE |
| 6403 | 482213082978 | LTL-1CHPE |
| 6404 | 482213082978 | LTL-1CHPE |
| 6405 | 482213010791 | LTL-1CHGE |
| 6406 | 482213082978 | LTL-1CHPE |
| 6407 | 482213082978 | LTL-1CHPE |
| 6408 | 482213082978 | LTL-1CHPE |
| 6409 | 482213082978 | LTL-1CHPE |
| 6410 | 823921052490 | LTL-2N3URK-071A |
| 6411 | 823921052490 | LTL-2N3URK-071A |
| 6412 | 482213030621 | 1N4148 |
| 6413 | 482213030621 | 1N4148 |
| 6414 | 482213030621 | 1N4148 |
| 6415 | 482213030621 | 1N4148 |
| 6416 | 482213030621 | 1N4148 |
| 6417 | 482213030621 | 1N4148 |

***ELECTRICAL PARTS LIST - FRONT BOARD***

DIODES

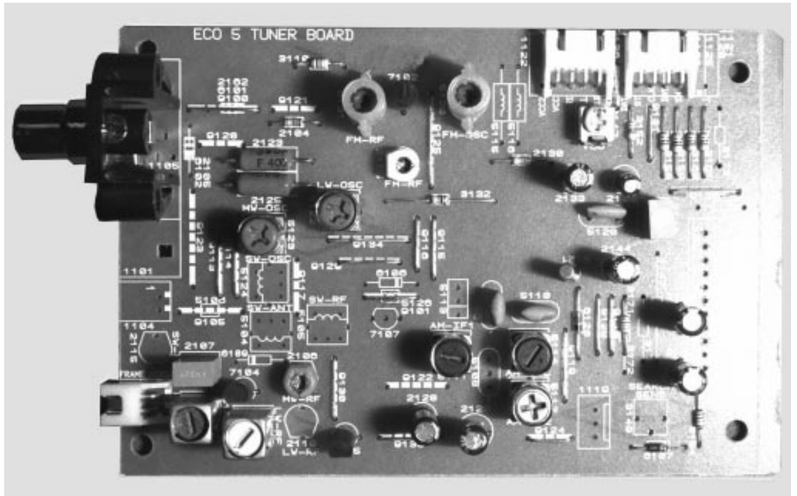
| | | |
|---|---|---|
| 6418 | 482213030621 | 1N4148 |
| 6419 | 482213030621 | 1N4148 |
| 6420 | 482213030621 | 1N4148 |
| 6421 | 482213030621 | 1N4148 |
| 6423 | 482213030621 | 1N4148 |
| 6425 | 482213031878 | 1N4003G |
| 6426 | 482213031878 | 1N4003G |
| 6428 | 482213030621 | 1N4148 |

TRANSISTORS & INTEGRATED CIRCUITS

| | | |
|---|---|---|
| 7400 | 482220931981 | SAA6579T |
| 7401 | 313911052400 | TMP87CS71F "C38S52401" |
| 7402 | 932213104668 | M24C01-WMN6 |
| 7403 | 482213060511 | BC847B |
| 7404 | 532220911306 | HEF4094BT |
| 7405 | 532220911306 | HEF4094BT |
| 7408 | 482213060511 | BC847B |
| 7409 | 482213010165 | GP1U28XP |
| 7410 | 482213060511 | BC847B |
| 7411 | 482213060511 | BC847B |
| 7412 | 482213060511 | BC847B |
| 7413 | 482213060511 | BC847B |
| 7414 | 482213060511 | BC847B |
| 7415 | 482213060511 | BC847B |

Note: Only the parts mentioned in this list are normal service spare parts.

7B-1
7B-1



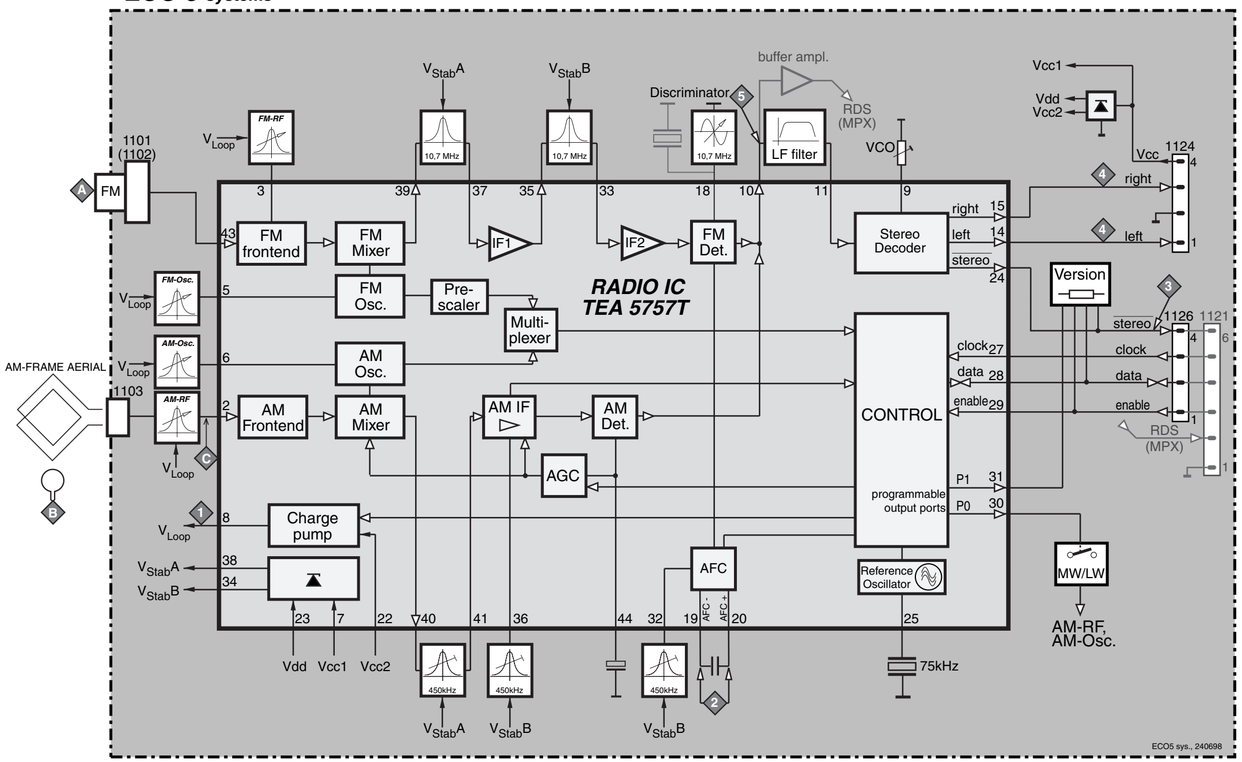

# TUNER BOARD ECO5

**TABLE OF CONTENTS**

Blockdiagram .....7B-1
Adjustmant table .....7B-2
Component layout .....7B-2
Circuit diagram .....7B-3
Partslist .....7B-4

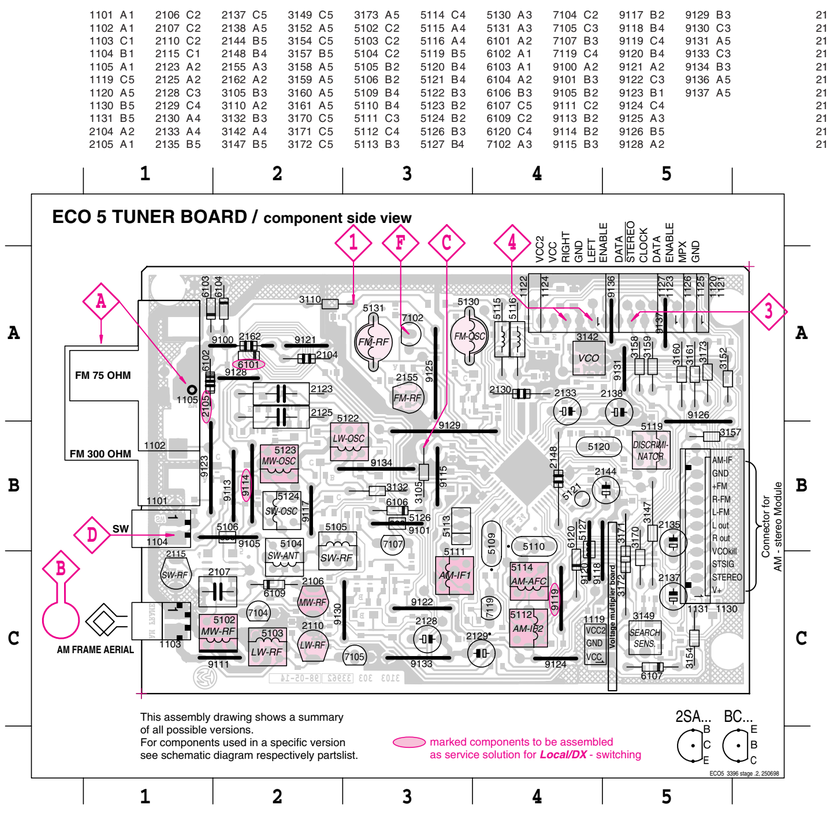
## BLOCKDIAGRAM

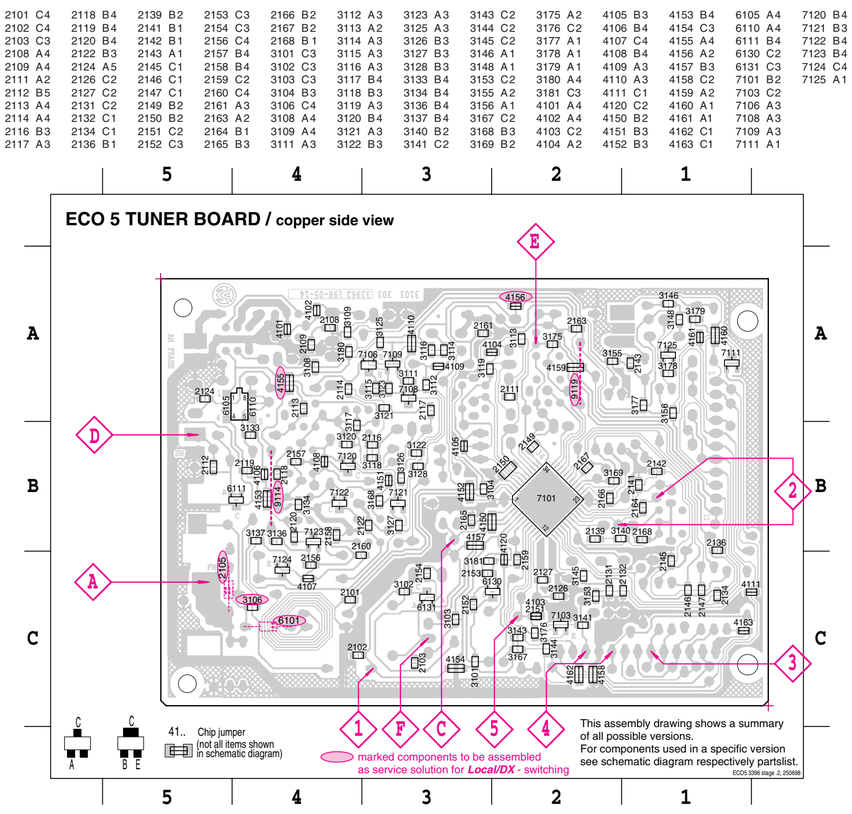
***TUNER BOARD***
***ECO 5 systems***



7B-2

7B-2


1101 A1 2106 C2 2137 C5 3149 C5 3173 A5 5114 C4 5130 A3 7104 C2 9117 B2 9129 B3
1102 A1 2107 C2 2138 A5 3152 A5 5102 C2 5115 A4 5131 A3 7105 C3 9118 B4 9130 C3
1103 C1 2110 C2 2144 B5 3154 C5 5103 C2 5116 A4 6101 A2 7107 B3 9119 C4 9131 A5
1104 B1 2115 C1 2148 B4 3157 B5 5104 C2 5119 B5 6102 A1 7119 C4 9120 B4 9133 C3
1105 A1 2123 A2 2155 A3 3158 A5 5105 B2 5120 B4 6103 A1 9100 A2 9121 A2 9134 B3
1119 C5 2125 A2 2162 A2 3159 A5 5106 B2 5121 B4 6104 A2 9101 B3 9122 C3 9136 A5
1120 A5 2128 C3 3105 B3 3160 A5 5109 B4 5122 B3 6106 B3 9105 B2 9123 B1 9137 A5
1130 B5 2129 C4 3110 A2 3161 A5 5110 B4 5123 B2 6107 C5 9111 C2 9124 C4
1131 B5 2130 A4 3132 B3 3170 C5 5111 C3 5124 B2 6109 C2 9113 B2 9125 A3
2104 A2 2133 A4 3142 A4 3171 C5 5112 C4 5126 B3 6120 C4 9114 B2 9126 B5
2105 A1 2135 B5 3147 B5 3172 C5 5113 B3 5127 B4 7102 A3 9115 B3 9128 A2
1 2 3 4 5
ECO 5 TUNER BOARD / component side view
VCC2 VCC RIGHT GND LEFT ENABLE DATA STEREO CLOCK DATA ENABLE MPX GND
FM 75 OHM
FM 300 OHM
SW
AM FRAME AERIAL
VCO
FM-RF
FM-OSC
LW-OSC
MW-OSC
SW-OSC
SW-ANT
SW-RF
AM-IF1
AM-AFC
AM-IF2
MW-RF
LW-RF
DISCRIM-INATOR
SEARCH SENS
Voltage multiplier
AM-IF
GND
+FM
R-FM
L-FM
L out
R out
VCOout
STSIG
STEREO
V+
Connector for AM - stereo Module
This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.
marked components to be assembled as service solution for Local/DX - switching
2SA... BC...
ECOS 3396 stage. 2, 250698




## TUNER ADJUSTMENT TABLE ( ECO5 FM/MW- and FM/MW/LW - versions with AM-frame aerial )

| Waverange | Input frequency | Input | Tuned to | Adjust | Output | Scope/Voltmeter |
|---|---|---|---|---|---|---|
| *VARICAP ALIGNMENT* | | | | | | |
| **FM** 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz) | | | 108MHz | 5130 | | 8V ±0.2V |
| | | | 87.5MHz (65.81MHz) | check | | 4.3V ±0.5V (1.2V ±0.5V) |
| **MW** FM/AM-version, 10kHz grid 530 - 1700kHz | | | 1700kHz | 5123 | | 8V ±0.2V |
| | | | 530kHz | check | | 1.1V ±0.4V |
| FM/MW-version, 9kHz grid 531 - 1602kHz | | | 1602kHz | 5123 | 1 | 6.9V ±0.2V |
| | | | 531kHz | check | | 1.1V ±0.4V |
| **LW** 153 - 279kHz | | | 279kHz | 5122 | | 8V ±0.2V |
| | | | 153kHz | check | | 1.1V ±0.4V |
| **MW** FM/MW/LW- version, 9kHz grid 531 - 1602kHz | | | 1602kHz | 5123 | | 8V ±0.2V |
| | | | 531kHz | check | | 1.1V ±0.4V |
| *FM IF* | | | | | | |
| **FM** | 10.7MHz, 50mV continuous wave | F | IC 7101 21 shortcircuit to block AFC 2141 | 5119 | 2 | 0 ± 3 mV DC |
| *FM RF* | | | | | | |
| **FM** 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz) | 108MHz | A | 108MHz | 2155 | 4 | MAX |
| | 87.5MHz (65.81MHz) | mod=1kHz Δf=±22.5kHz | 87.5MHz (65.81MHz) | 5131 | | |
| *VCO* | | | | | | |
| **FM** | 98MHz, 1mV continuous wave | A | 98MHz | 3142 | 3 | 152kHz ±1kHz [1] |
| *AM IF* | | | | | | |
| **MW** | 450kHz connect pin 6 of IC 7101 (AM Osc.) with short wire to ground (pin 4) | C | IC 7101 36 220R 100nF | 5111 | 4 | max. $f_o$ symmetric |
| | | Δf=±15kHz $V_{RF}$ = 3mV | IC 7101 40 see remark [2] 220R 100nF | 5112 | | |
| *AM AFC* **MW** | | C continuous wave $V_{RF}$ = 10mV | | 5114 | 2 | 0 ± 2 mV DC |
| *AM RF* [3] | | | | | | |
| **MW** [4] FM/MW/LW- and FM/MW-version ( 9kHz grid) 531 - 1602kHz | 1494kHz | B | 1494kHz | 2106 | 4 | max. $f_o$ symmetric |
| | 558kHz | | 558kHz | 5102 | | |
| **LW** | 198kHz | | 198kHz | 5103 | | |
| **MW** FM/AM-version, 10kHz grid 530 - 1700kHz | 1500kHz | Δf = ±30kHz $V_{RF}$ as low as possible | 1500kHz | 2106 | | |
| | 560kHz | | 560kHz | 5102 | | |

ECOS, discr. coil, 090797

Use service test program. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

1) If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

2) RC network serves for damping the IF-filter while adjusting the other one.

3) For AM RF adjustments the original frame antenna has to be used !

4) MW has to be aligned before LW.

↕ Repeat

7B-3

# TUNER BOARD ECO5 / Systems

| VERSION PROGRAMMING COMPONENTS | | | | | |
|---|---|---|---|---|---|
| | 6120 | 3156 | 3157 | 3170 | remark |
| /00 FM/MW/LW | x | - | - | - | 7111 not mounted |
| /00 FM/MW/LW/SW-Eu | - | - | - | - | |
| /01 FM/MW-Stereo | - | - | x | - | SW |
| /01 FM/MW | - | x | - | x | |
| /01 FM/MW/SW-Ov | - | x | - | - | |
| /06 FM-Japan/MW-stereo | - | - | - | x | |
| /13 FM/MW-Stereo | - | - | x | - | SW |
| /14 FM-OIRT/MW/LW | x | - | x | x | |
| /14 FM-OIRT/MW | x | - | x | - | |
| /17 FM/AM-Stereo | - | - | x | - | SW |
| /17 FM/AM | x | - | - | x | |
| /.. FM/MW/2xSW | - | - | x | x | |
| /15 FM/MW/SW-Eu | - | x | x | x | |

x = component mounted
SW = Software initialisation

r....for RDS version only
s...for East European version (/14/34) only
t....for Japanese version (/06/26) only
u...for 2-band (FM/AM) version only
v...for SW-version 3.9-12.1MHz only
w...for LW only
x....not for all versions
y....for USA version (/17/37) only
z....for AM-STEREO (/06/13/26/33) versions only

Signal path: FM; AM; MPX (Audio Frequency); AF - left/right

Vdc FM mode stereo; Vdc MW mode; Vdc LW mode

Voltages measured while set is tuned to a strong transmitter

ECO5 systems, discr.coil, 030998

7B-4

## ELECTRICAL PARTS LIST - ECO5 TUNER BOARD

ELECTRICAL PARTS LIST - ECO5 TUNER BOARD

### MISCELLANEOUS

| | | | |
|---|---|---|---|
| 1101 | 4822 267 31505 | Antenna Socket 300R | |
| 1102 | 4822 267 10283 | Antenna Socket Coax IEC 75R | |

### CAPACITORS

| | | | |
|---|---|---|---|
| 2101 | 5322 122 32531 | 100pF 5% 50V | |
| 2101 | 4822 126 13692 | 47pF 1% 63V | for USA |
| 2102 | 4822 122 33177 | 10nF 20% 50V | |
| 2103 | 5322 122 34123 | 1nF 10% 50V | |
| 2104 | 4822 122 33195 | 100pF 10% 50V | |
| 2106 | 4822 125 50355 | Trimmer 4-20pF | for LW version |
| 2106 | 4822 125 60101 | Trimmer 3-11pF 100V | |
| 2107 | 4822 121 51319 | 1µF 10% 63V | |
| 2108 | 5322 122 32531 | 100pF 5% 50V | for LW version |
| 2109 | 5322 122 32448 | 10pF 5% 50V | for LW version |
| 2120 | 4822 126 13691 | 27pF 1% 63V | for LW version |
| 2120 | 5322 122 32658 | 22pF 5% 50V | |
| 2122 | 4822 122 33891 | 3,3nF 10% 63V | for LW version |
| 2125 | 4822 121 51381 | 560pF 5% 400V | |
| 2126 | 5322 122 31863 | 330pF 5% 50V | |
| 2127 | 4822 126 13473 | 220nF +80/-20% 50V | |
| 2128 | 4822 124 41579 | 10µF 20% 50V | |
| 2129 | 4822 124 41584 | 100µF 20% 10V | |
| 2130 | 4822 126 11585 | 22nF+80/- 20% 25V | |
| 2131 | 4822 122 33325 | 470nF 16V | |
| 2131 | 4822 126 13482 | 470nF +80/- 20% 16V | |
| 2132 | 4822 126 13482 | 470nF +80/- 20% 16V | |
| 2133 | 4822 124 40242 | 1µF 20% 63V | |
| 2134 | 4822 126 13188 | 15nF 5% 63V | |
| 2134 | 5322 122 32654 | 22nF 10% 63V | for USA |
| 2135 | 4822 124 40746 | 0,22µF 20% 63V | |
| 2136 | 4822 126 13188 | 15nF 5% 63V | |
| 2136 | 5322 122 32654 | 22nF 10% 63V | for USA |
| 2137 | 4822 124 40746 | 0,22µF 20% 63V | |
| 2138 | 4822 124 41576 | 2,2µF 20% 50V | |
| 2139 | 4822 126 14236 | 50V 15pF 5% | |
| 2140 | 4822 121 51252 | 470nF 5% 63V | |
| 2141 | 4822 126 10002 | 100nF 20% 25V | |
| 2142 | 4822 126 10002 | 100nF 20% 25V | |
| 2143 | 4822 126 13473 | 220nF +80/-20% 50V | |
| 2144 | 4822 124 40242 | 1µF 20% 63V | |
| 2145 | 4822 122 33575 | 220pF 5% 50V | |
| 2146 | 4822 122 33575 | 220pF 5% 50V | |
| 2147 | 4822 122 33575 | 220pF 5% 50V | |
| 2148 | 4822 126 11585 | 22nF+80/- 20% 25V | |
| 2149 | 5322 122 32654 | 22nF 10% 63V | |
| 2150 | 4822 122 31947 | 100nF 20% 63V | |
| 2152 | 5322 116 80853 | 560pF 5% 63V | for East. Europe |
| 2152 | 4822 126 12105 | 33nF 5% 63V | |
| 2153 | 4822 122 32139 | 12pF 2% 63V | for East. Europe |
| 2153 | 4822 122 32504 | 15pF 2% 63V | |
| 2155 | 4822 125 60101 | Trimmer 3-11pF 100V | |
| 2158 | 5322 122 32448 | 10pF 5% 50V | for LW version |
| 2159 | 5322 122 32659 | 33pF 5% 50V | |
| 2160 | 5322 122 32654 | 22nF 10% 63V | |
| 2161 | 4822 126 10002 | 100nF 20% 25V | |
| 2163 | 4822 126 10002 | 100nF 20% 25V | |
| 2164 | 4822 126 13482 | 470nF +80/- 20% 16V | |
| 2165 | 4822 126 10002 | 100nF 20% 25V | |
| 2166 | 5322 122 34123 | 1nF 10% 50V | |
| 2167 | 4822 122 32139 | 12pF 2% 63V | |
| 2168 | 4822 126 13695 | 82pF 1% 63V | |

### RESISTORS

| | | | |
|---|---|---|---|
| 3101 | 4822 051 20562 | 5k6 5% 0,1W | for East. Europe |
| 3101 | 4822 051 20333 | 33k 5% 0,1W | |
| 3102 | 4822 051 20104 | 100k 5% 0,1W | |
| 3103 | 4822 117 10965 | 18k 1% 0,1W | |
| 3104 | 4822 117 11448 | 180R 1% 0,1W | |
| 3105 | 4822 116 83872 | 220R 5% 0,5W | |
| 3108 | 4822 117 11449 | 2k2 1% 0,1W | for LW version |
| 3109 | 4822 051 20472 | 4k7 5% 0,1W | for LW version |
| 3110 | 4822 116 52195 | 47R 5% 0,5W | |
| 3120 | 4822 051 20008 | 0R Jumper 0805 | |
| 3123 | 4822 051 20472 | 4k7 5% 0,1W | for LW version |
| 3125 | 4822 117 10833 | 10k 1% 0,1W | for LW version |
| 3128 | 4822 117 11449 | 2k2 1% 0,1W | for LW version |
| 3132 | 4822 116 52195 | 47R 5% 0,5W | |
| 3134 | 4822 051 20223 | 22k 5% 0,1W | |
| 3137 | 4822 051 20223 | 22k 5% 0,1W | for LW version |
| 3140 | 4822 051 20008 | 0R Jumper 0805 | |
| | | 5120=CDA10.7MG40K | |
| 3140 | 4822 117 10353 | 150R 1% 0,1W | |
| | | 5120=CDA10.7MG61KA | |
| 3141 | 4822 051 20563 | 56k 5% 0,1W | |
| 3142 | 4822 100 11163 | Trimmer 100k 30% 0,1W | |
| 3143 | 4822 051 20223 | 22k 5% 0,1W | for RDS version |
| 3144 | 4822 051 10102 | 1k 2% 0,25W | for RDS version |
| 3145 | 4822 117 11449 | 2k2 1% 0,1W | |
| 3146 | 4822 051 20229 | 22R 5% 0,1W | |
| 3152 | 4822 116 83883 | 470R 5% 0,5W | |
| 3153 | 4822 051 20471 | 470R 5% 0,1W | |
| 3154 | 4822 116 83868 | 150R 5% 0,5W | |
| 3155 | 4822 051 20471 | 470R 5% 0,1W | |
| 3156 | 4822 051 20104 | 100k 5% 0,1W | for /21/30/33 only |
| 3157 | 4822 116 52234 | 100k 5% 0,5W | for East. Europe |
| 3158 | 4822 116 83883 | 470R 5% 0,5W | |
| 3159 | 4822 116 83883 | 470R 5% 0,5W | |
| 3160 | 4822 116 83883 | 470R 5% 0,5W | |
| 3161 | 4822 116 83883 | 470R 5% 0,5W | |
| 3167 | 4822 117 11503 | 220R 1% 0.1W | |
| 3169 | 4822 051 20154 | 150k 5% 0,1W | |
| 3170 | 4822 116 52234 | 100k 5% 0,5W | |
| 3171 | 4822 116 52219 | 330R 5% 0,5W | |
| 3176 | 4822 051 10102 | 1k 2% 0,25W | for RDS version |
| 3180 | 4822 051 20223 | 22k 5% 0,1W | for LW version |
| 4101 | 4822 051 20008 | 0R Jumper 0805 | for 2-Band only |
| 4102 | 4822 051 20008 | 0R Jumper 0805 | for 2-Band only |
| 4103 | 4822 051 20008 | 0R Jumper 0805 | |
| 4104 | 4822 051 20008 | 0R Jumper 0805 | |
| 4105 | 4822 051 20008 | 0R Jumper 0805 | |
| 4106 | 4822 051 20008 | 0R Jumper 0805 | |
| 4108 | 4822 051 20008 | 0R Jumper 0805 | |
| 4111 | 4822 051 20008 | 0R Jumper 0805 | |
| 4120 | 4822 051 20008 | 0R Jumper 0805 | |
| 4150 | 4822 051 10008 | 0R Jumper 1206 | |
| 4151 | 4822 051 20008 | 0R Jumper 0805 | |
| 4152 | 4822 051 10008 | 0R Jumper 1206 | |
| 4153 | 4822 051 10008 | 0R Jumper 1206 | |
| 4154 | 4822 051 10008 | 0R Jumper 1206 | |
| 4155 | 4822 051 10008 | 0R Jumper 1206 | |
| 4156 | 4822 051 20008 | 0R Jumper 0805 | |
| 4157 | 4822 051 10008 | 0R Jumper 1206 | |
| 4158 | 4822 051 10008 | 0R Jumper 1206 | |
| 4159 | 4822 051 10008 | 0R Jumper 1206 | |
| 4162 | 4822 051 10008 | 0R Jumper 1206 | |

### COILS & FILTERS

| | | | |
|---|---|---|---|
| 5102 | 4822 157 71634 | MW RF Coil | |
| 5103 | 4822 157 71635 | LW RF Coil | for LW version |
| 5109 | 4822 242 70665 | Ceram Filter 10,7MHz | |
| 5110 | 4822 242 70665 | Ceram Filter 10,7MHz | |
| 5111 | 4822 158 60511 | AM-IF Filter 450kHz | |
| 5112 | 4822 157 70302 | AM-IF Filter 450kHz | |
| 5114 | 4822 157 70302 | AM-IF Filter 450kHz | |
| 5119 | 4822 157 11443 | Discriminator 10,7MHz | |
| 5120 | 4822 242 82065 | Cer. Disc. 10,7MG40K | |
| 5120 | 4822 242 10251 | Cer. Disc.10,7MG61KA-TF21 | |
| 5121 | 4822 242 10261 | Quartz 75kHz | |
| 5122 | 4822 157 60517 | Osc. Coil LW | for LW version |
| 5123 | 4822 157 60517 | Osc. Coil MW | |
| 5130 | 4822 156 30947 | RF-Coil 1.5T | |
| 5131 | 4822 156 30947 | RF-Coil 1.5T | |

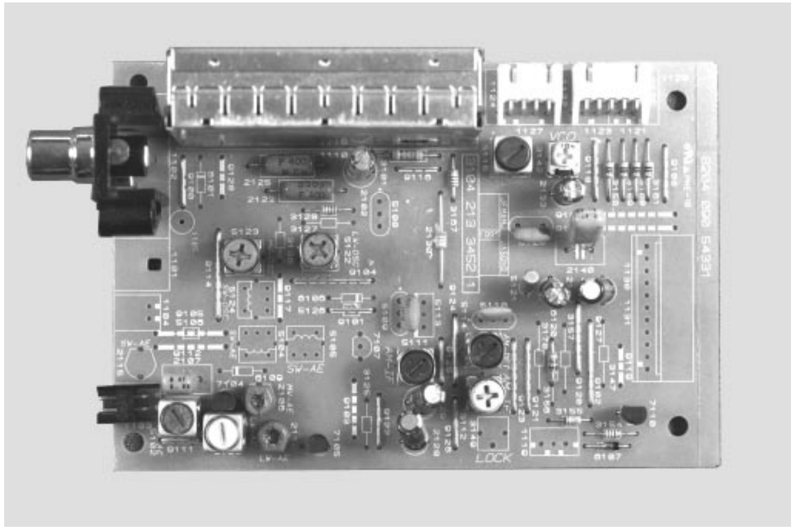
### DIODES

| | | | |
|---|---|---|---|
| 6103 | 4822 130 30621 | 1N4148 | |
| 6104 | 4822 130 30621 | 1N4148 | |
| 6105 | 4822 130 83075 | HN1V02H-B | |
| 6106 | 4822 130 30621 | 1N4148 | |
| 6107 | 4822 130 34488 | BZX79-B11 | |
| 6120 | 4822 130 30621 | 1N4148 | not for /21/30/33 |
| 6130 | 4822 130 82833 | 1SV228 | |
| 6131 | 4822 130 82833 | 1SV228 | |

### TRANSISTORS & INTEGRATED CIRCUITS

| | | | |
|---|---|---|---|
| 7101 | 4822 209 90924 | TEA5757H/V1 | |
| 7102 | 4822 130 60093 | 2SA838B | |
| 7103 | 4822 130 42513 | BC858C | for RDS version |
| 7104 | 5322 130 44779 | BC338-40 | for LW version |
| 7105 | 5322 130 44779 | BC338-40 | for LW version |
| 7109 | 5322 130 41983 | BC858B | for LW version |
| 7111 | 5322 130 42136 | BC848C | |
| 7122 | 5322 130 42136 | BC848C | for LW version |
| 7124 | 5322 130 42136 | BC848C | for LW version |

Note: Only the parts mentioned in this list are normal service spare parts.



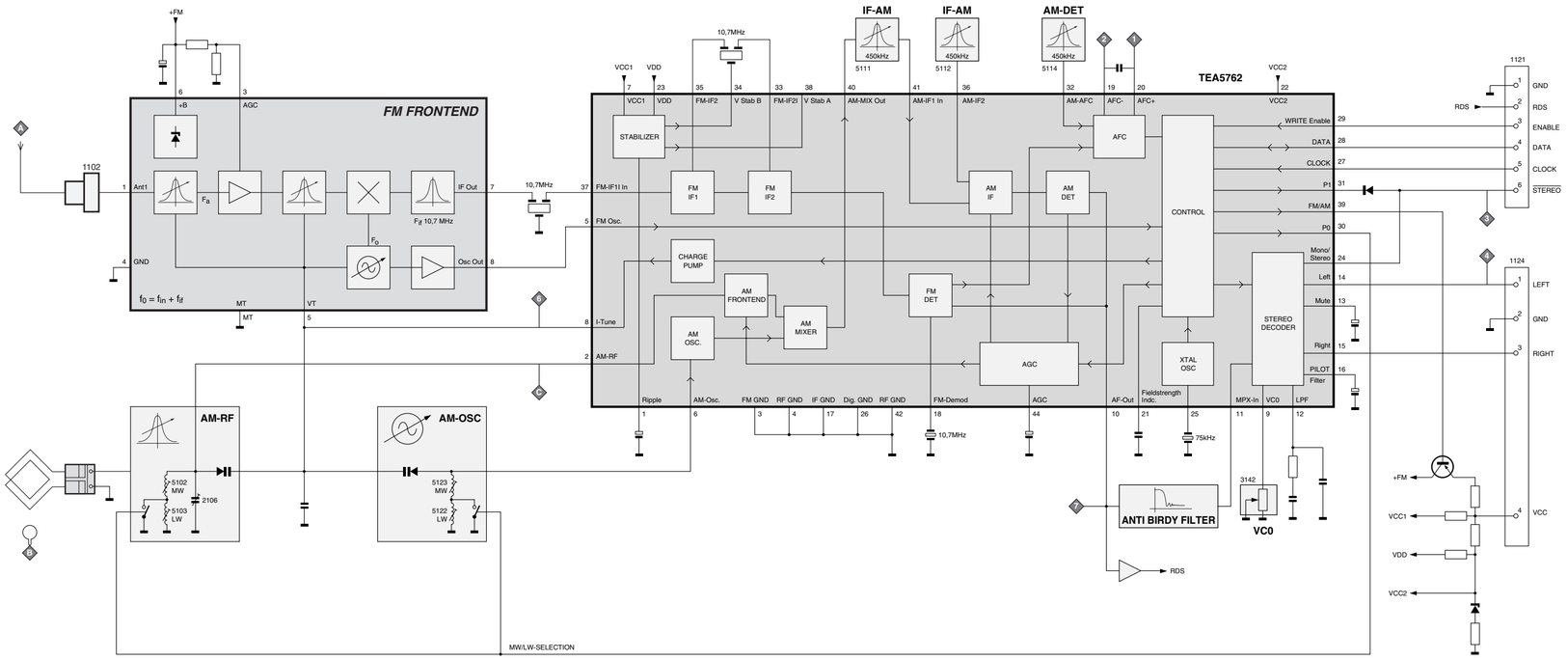
# TUNER 95 BOARD

**TABLE OF CONTENTS**


Blockdiagram .....7D-1
Adjustmant table .....7D-2
Component layout.....7D-2
Circuit diagram.....7D-3
Partslist .....7D-4


7D-1

## BLOCKDIAGRAM



## TUNER 95 bis Adjustment Table (FM, MW, LW with Frame antenna)

| Waverange | Input frequency | Input | Set tuned to | Adjust | Output | Scope / Voltmeter |
|---|---|---|---|---|---|---|
| ***VARICAP ALIGNMENT*** | | | | | | |
| **FM** (50) | | | 108 MHz | check | | 7 ... 9V |
| 87.5 - 108 MHz | | | 87.5 MHz | check | | 1.3 ... 2V |
| **MW** (9) | | | 1602 kHz | 5123 | ◇6 | 8.3V ± 0.2V |
| 531 - 1602 kHz | | | 531 kHz | check | | 1V ± 0.4V |
| **LW** (3) | | | 279 kHz | 5122 | | 8.3V ± 0.2V |
| 153 - 279 kHz | | | 153 kHz | check | | 1V ± 0.4V |
| ***FM – DETECTION*** | | | | | | |
| **FM** | 98 MHz 1mV continuous wave *short pin 21 (IC7101) to ground* | ◇A | 98 MHz | 5107 | ◇1 ◇2 | 0mV ± 3mV |
| ***FM – VCO*** | | | | | | |
| **FM** | 98 MHz 1 mV continuous wave | ◇A | 98 MHz | 3142 | ◇3 | 152kHz ± 1 kHz |
| ***DISTORTION*** | | | | | | |
| **FM** | 98 MHz 1 mV 90 % L + 9 % pilot mod = 1kHz | ◇A | 98MHz | mixcoil inside Tuner 1110 | ◇4 | Distortion minimum |
| ***AM – IF*** | | | | | | |
| **MW** | 450kHz Δf = 10kHz Low as possible Swept signal | 100nF 50E | MW | 5111 | ◇7 | symmetrical and max. height |
| | | | | 5112 | | |
| | 450kHz continuous wave | ◇C | | 5114 | ◇1 ◇2 | 0mV ± 2mV |
| ***AM - RF*** | | | | | | |
| **MW** | 558kHz Mod = 1kHz 30 % AM 1494 kHz | ◇B | 558kHz | 5102 | ◇7 | MAX |
| | | | 1494kHz | 2106 | | |
| **LW** | 198kHz mod = 1kHz 30 % AM | * | 198kHz | 5103 | | MAX |

adjtable for 3104 217 04121/04341

* Signal send via a frame antenna
(..) = tuning grid in kHz

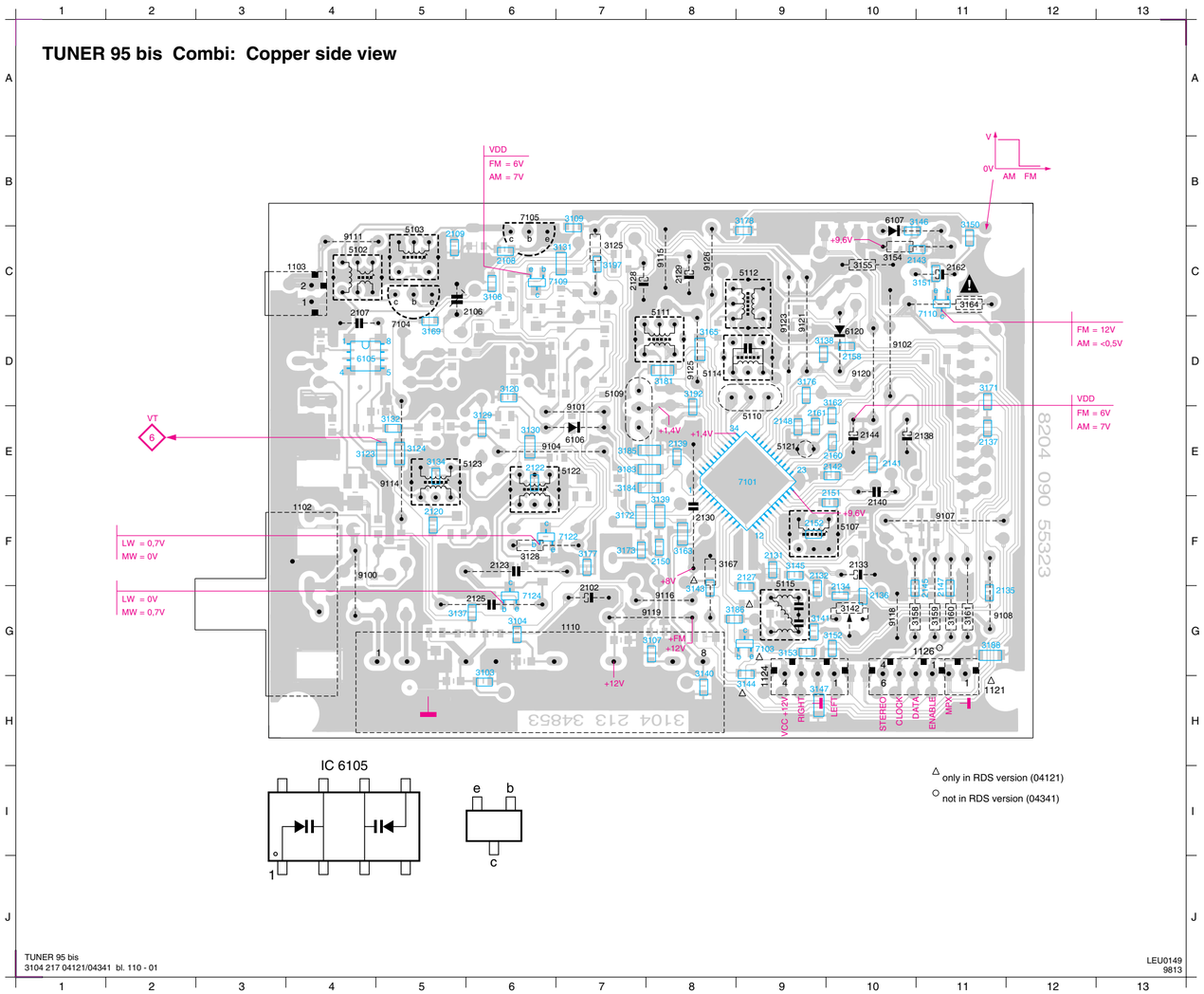
↕ repeat





7D-2

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1102 | F4 | 2107 | C4 | 2128 | C7 | 2136 | G10 | 2144 | E10 | 2160 | E9 | 3120 | D6 | 3132 | E5 | 3143 | G8 | 3153 | G9 | 3163 | F8 | 3176 | D9 | 3188 | G11 | 5111 | C8 | 6106 | E7 | 7110 | D11 | 9108 | G11 | 9121 | D9 |
| 1103 | C4 | 2108 | C6 | 2129 | C8 | 2137 | E11 | 2145 | G11 | 2161 | E9 | 3123 | E4 | 3134 | E5 | 3144 | H9 | 3154 | C10 | 3164 | C11 | 3177 | F7 | 3192 | D8 | 5112 | C9 | 6107 | B10 | 7122 | F7 | 9111 | C4 | 9123 | D9 |
| 1110 | G7 | 2109 | C5 | 2130 | F8 | 2138 | E10 | 2147 | G11 | 2162 | C11 | 3124 | E5 | 3137 | G5 | 3145 | F9 | 3155 | C10 | 3165 | D8 | 3178 | B8 | 3197 | C7 | 5114 | D8 | 6120 | D10 | 7124 | G6 | 9114 | E5 | 9125 | D8 |
| 1121 | H11 | 2120 | F5 | 2131 | F9 | 2139 | E8 | 2148 | E9 | 3103 | H6 | 3125 | C7 | 3138 | D9 | 3146 | B10 | 3158 | G11 | 3167 | F8 | 3181 | D8 | 5102 | C4 | 5115 | G9 | 7101 | E9 | 9100 | F4 | 9115 | C8 | 9126 | C8 |
| 1124 | H9 | 2122 | E6 | 2132 | F9 | 2140 | F10 | 2150 | F8 | 3104 | G6 | 3128 | F6 | 3139 | F8 | 3147 | H9 | 3159 | G11 | 3169 | D5 | 3183 | E7 | 5103 | C5 | 5121 | E9 | 7103 | G9 | 9101 | E7 | 9116 | G8 | | |
| 1126 | G10 | 2123 | F6 | 2133 | F10 | 2141 | E10 | 2151 | F9 | 3107 | G7 | 3129 | E6 | 3140 | H8 | 3150 | C11 | 3160 | G11 | 3171 | D11 | 3184 | E7 | 5107 | F10 | 5122 | E7 | 7104 | D5 | 9102 | D10 | 9118 | G10 | | |
| 2102 | G7 | 2125 | G6 | 2134 | G10 | 2142 | E9 | 2152 | F9 | 3108 | C6 | 3130 | E6 | 3141 | G9 | 3151 | C10 | 3161 | G11 | 3172 | F7 | 3185 | E7 | 5109 | D7 | 5123 | E5 | 7105 | B6 | 9104 | E6 | 9119 | G7 | | |
| 2106 | C5 | 2127 | F9 | 2135 | G11 | 2143 | C10 | 2158 | D10 | 3109 | B7 | 3131 | C6 | 3142 | G10 | 3152 | G9 | 3162 | D9 | 3173 | F7 | 3186 | G8 | 5110 | E9 | 6105 | D4 | 7109 | C6 | 9107 | F11 | 9120 | D10 | | |



7D-3

| | | |

7D-4

## ELECTRICAL PARTS LIST - TUNER 95 BOARD

ELECTRICAL PARTS LIST - TUNER 95 BOARD

### MISCELLANEOUS

| | | |
|---|---|---|
| 1102 | 4822 267 10283 | Socket Coaxial IEC 75R |
| 1103 | 4822 265 31184 | JST Connector 2 pin |
| 1110 | 4822 210 10739 | Frontend Assembly FE415-G23 |

### CAPACITORS

| | | |
|---|---|---|
| 2102 | 4822 124 40433 | 47µF 20% 25V |
| 2106 | 4822 125 60102 | Trimmer 5,2-30pF 100V |
| 2107 | 4822 121 51252 | 470nF 5% 63V |
| 2108 | 4822 126 13695 | 82pF 1% 63V |
| 2109 | 4822 126 13691 | 27pF 1% 63V |
| 2120 | 5322 122 32659 | 33pF 5% 50V |
| 2122 | 5322 126 10465 | 3,9nF 10% 50V |
| 2123 | 4822 121 10766 | 390pF 1% 630V |
| 2125 | 4822 121 10578 | 560pF 1% 630V |
| 2127 | 4822 122 32927 | 220nF +80/-20% 50V |
| 2128 | 4822 124 41579 | 10µF 20% 50V |
| 2129 | 4822 124 40242 | 1µF 20% 63V |
| 2130 | 4822 126 11585 | 22nF +80/-20% 25V |
| 2131 | 4822 122 33325 | 470nF 16V |
| 2132 | 4822 122 33325 | 470nF 16V |
| 2133 | 4822 124 40242 | 1µF 20% 63V |
| 2134 | 4822 126 13188 | 15nF 5% 63V |
| 2135 | 4822 122 32927 | 220nF +80/-20% 50V |
| 2136 | 4822 126 13188 | 15nF 5% 63V |
| 2137 | 4822 122 32927 | 220nF +80/-20% 50V |
| 2138 | 4822 124 41576 | 2,2µF 20% 50V |
| 2139 | 4822 126 10002 | 100nF 20% 25V |
| 2140 | 4822 121 51252 | 470nF 5% 63V |
| 2141 | 4822 122 31947 | 100nF 20% 63V |
| 2142 | 4822 122 31947 | 100nF 20% 63V |
| 2143 | 4822 122 32927 | 220nF +80/-20% 50V |
| 2144 | 4822 124 40242 | 1µF 20% 63V |
| 2145 | 4822 122 33575 | 220pF 5% 50V |
| 2147 | 4822 122 33575 | 220pF 5% 50V |
| 2148 | 4822 122 33809 | 22nF 20% 50V |
| 2150 | 4822 122 31947 | 100nF 20% 63V |
| 2151 | 4822 126 14236 | 15pF 5% 50V |
| 2152 | 4822 126 13695 | 82pF 1% 63V |
| 2158 | 4822 122 31947 | 100nF 20% 63V |
| 2160 | 4822 122 32139 | 12pF 2% 63V |
| 2161 | 5322 122 34123 | 1nF 10% 50V |
| 2162 | 4822 124 81151 | 22µF 50V |

### RESISTORS

| | | |
|---|---|---|
| 3103 | 4822 051 20008 | 0R Jumper 0805 |
| 3104 | 4822 051 10102 | 1k 2% 0,25W |
| 3107 | 4822 051 20829 | 82R 5% 0,1W |
| 3108 | 4822 117 11449 | 2k2 1% 0,1W |
| 3109 | 4822 117 11449 | 2k2 1% 0,1W |
| 3120 | 4822 051 20008 | 0R Jumper 0805 |
| 3123 | 4822 051 10008 | 0R Jumper 1206 |
| 3124 | 4822 051 10008 | 0R Jumper 1206 |
| 3125 | 4822 116 83864 | 10k 5% 0,5W |
| 3128 | 4822 116 52256 | 2k2 5% 0,5W |
| 3129 | 4822 051 20008 | 0R Jumper 0805 |
| 3130 | 4822 051 10008 | 0R Jumper 1206 |
| 3131 | 4822 051 10008 | 0R Jumper 1206 |
| 3132 | 4822 051 20008 | 0R Jumper 0805 |
| 3134 | 4822 051 20223 | 22k 5% 0,1W |
| 3137 | 4822 117 10833 | 10k 1% 0,1W |
| 3138 | 4822 051 20008 | 0R Jumper 0805 |
| 3139 | 4822 051 10008 | 0R Jumper 1206 |
| 3140 | 4822 051 20331 | 330R 5% 0,1W |
| 3141 | 4822 117 11148 | 56k 1% 0,1W |
| 3142 | 4822 100 11163 | Trimmer 100k 30% 0,1W |
| 3143 | 4822 051 20223 | 22k 5% 0,1W |
| 3144 | 4822 051 10102 | 1k 2% 0,25W |
| 3145 | 4822 117 11449 | 2k2 1% 0,1W |
| 3146 | 4822 051 20479 | 47R 5% 0,1W |
| 3147 | 4822 051 10008 | 0R Jumper 1206 |
| 3150 | 4822 051 20472 | 4k7 5% 0,1W |
| 3151 | 4822 051 20683 | 68k 5% 0,1W |
| 3152 | 4822 051 20471 | 470R 5% 0,1W |
| 3153 | 4822 051 20471 | 470R 5% 0,1W |
| 3154 | 4822 116 83872 | 220R 5% 0,5W |
| 3155 | 4822 116 52219 | 330R 5% 0,5W |
| 3158 | 4822 116 83883 | 470R 5% 0,5W |
| 3159 | 4822 116 83883 | 470R 5% 0,5W |
| 3160 | 4822 116 83883 | 470R 5% 0,5W |
| 3161 | 4822 116 83883 | 470R 5% 0,5W |
| 3162 | 4822 117 13579 | 220k 1% 0,1W |
| 3163 | 4822 051 10008 | 0R Jumper 1206 |
| 3164 | 4822 052 10478 ⚠ | 4R7 5% 0,33W |
| 3165 | 4822 051 10008 | 0R Jumper 1206 |
| 3167 | 4822 116 83872 | 220R 5% 0,5W |
| 3169 | 4822 051 20008 | 0R Jumper 0805 |
| 3171 | 4822 051 20008 | 0R Jumper 0805 |
| 3172 | 4822 051 10008 | 0R Jumper 1206 |
| 3173 | 4822 051 20008 | 0R Jumper 0805 |
| 3176 | 4822 051 20008 | 0R Jumper 0805 |
| 3177 | 4822 051 20223 | 22k 5% 0,1W |
| 3178 | 4822 051 10008 | 0R Jumper 1206 |
| 3181 | 4822 051 10008 | 0R Jumper 1206 |
| 3183 | 4822 051 10008 | 0R Jumper 1206 |
| 3184 | 4822 051 10008 | 0R Jumper 1206 |
| 3185 | 4822 051 10008 | 0R Jumper 1206 |
| 3186 | 4822 051 10102 | 1k 2% 0,25W |
| 3188 | 4822 051 10008 | 0R Jumper 1206 |
| 3192 | 4822 051 20008 | 0R Jumper 0805 |
| 3197 | 4822 051 20472 | 4k7 5% 0,1W |

### COILS & FILTERS

| | | |
|---|---|---|
| 5102 | 4822 157 71634 | MW Aerial |
| 5103 | 4822 157 71635 | LW Aerial |
| 5107 | 4822 157 11443 | FM Discriminator 10,7MHz |
| 5109 | 4822 157 71639 | Ceram Filter 10,7MHz |
| 5110 | 4822 242 70665 | Ceram Filter 10,7MHz |
| 5111 | 4822 158 60511 | AM-IF Filter 450kHz |
| 5112 | 4822 157 70302 | AM-IF Filter 450kHz |
| 5114 | 4822 157 70302 | AM_IF Filter 450kHz |
| 5115 | 4822 157 71636 | Anti-Birdy Filter |
| 5121 | 4822 242 10261 | X'tal Resonator 75kHZ |
| 5122 | 4822 157 60517 | RF Coil AM |
| 5123 | 4822 157 60517 | RF Coil AM |

### DIODES

| | | |
|---|---|---|
| 6105 | 4822 130 83075 | HN1V02H-B |
| 6106 | 4822 130 30621 | 1N4148 |
| 6107 | 4822 130 34488 | BZX79-C11 |
| 6120 | 4822 130 30621 | 1N4148 |

### TRANSISTORS & INTEGRATED CIRCUITS

| | | |
|---|---|---|
| 7101 | 4822 209 90315 | TEA5762H/V1 |
| 7103 | 4822 130 42513 | BC858C |
| 7104 | 5322 130 44779 | BC338-40 |
| 7105 | 5322 130 44779 | BC338-40 |
| 7109 | 5322 130 41983 | BC858B |
| 7110 | 5322 130 41983 | BC858B |
| 7122 | 5322 130 42136 | BC848C |
| 7124 | 5322 130 42136 | BC848C |

Note : Only the parts mentioned in this list are normal service spare parts.

# ETF7 TAPE MODULE

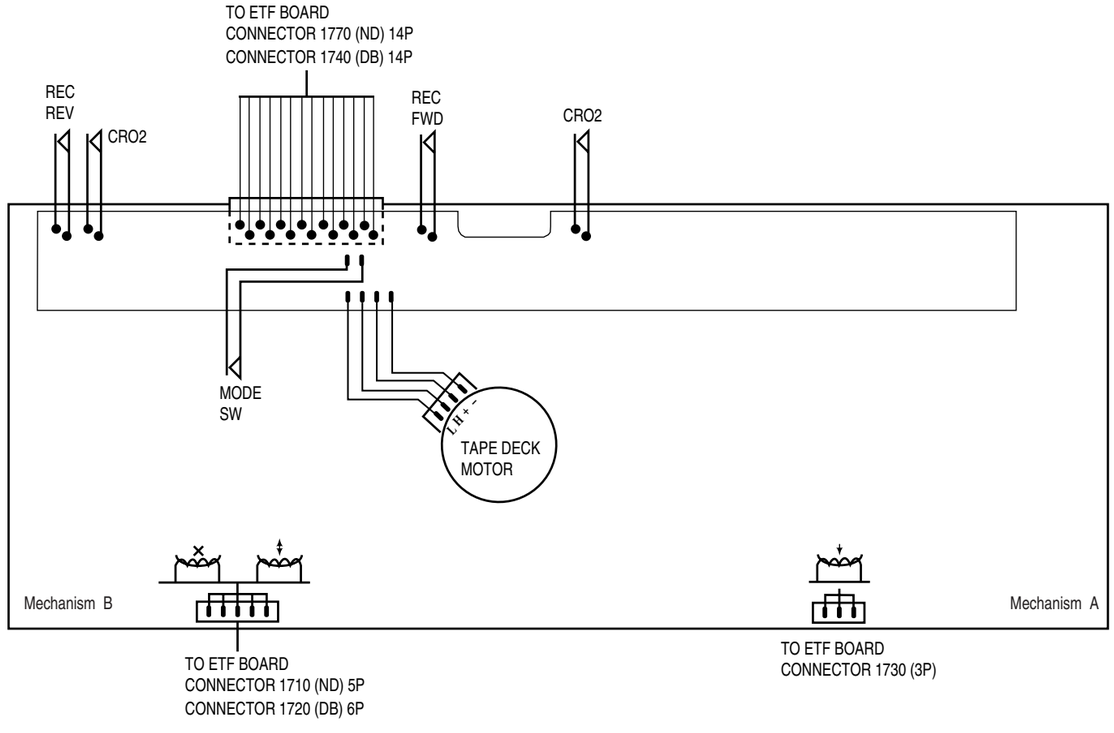
## *(Non-Dolby Version)*

**TABLE OF CONTENTS**


Tape Module Wiring & variation table ..... 9-1
Block diagram ..... 9-2
Brief Introduction ..... 9-3
Connector assignment ..... 9-4
Tape deck electronics & Tape adjustments ..... 9-5
ETF7 Non-Dolby board layouts ..... 9-6
Analog Circuit diagram ..... 9-7
Servo Circuit diagram ..... 9-8
Exploded views & parts list ..... 9-9
Electrical parts list ..... 9-13


9-1

**Tapedeck wiring (Double deck)**




**OPTIONS / VARIANTS TABLE**

| **MODULE** | **ETF7** | | |
|---|---|---|---|
| **VARIANT** | **1** | **2** | **3** |
| **FEATURES** | **DB/DD/FR** | **ND/DD/FR** | **ND/DD/FF** |
| Deck configuration | double | double | double |
| Deck type (Tokyo Pigeon) | CWE | CWE | CWE |
| Autoreverse | yes (B) | yes (B) | no |
| Auto Replay | no | no | yes (A+B) |
| Motor configuration | single | single | single |
| Auto tape type selection | yes | yes | yes |
| Dolby type B Noise Reduction | yes | no | no |
| 19 kHz pilot suppression | yes | no | no |
| Normal / High speed dubbing | yes | yes | no |
| Cue/Review & Fwd/Rewind | yes | yes | yes |

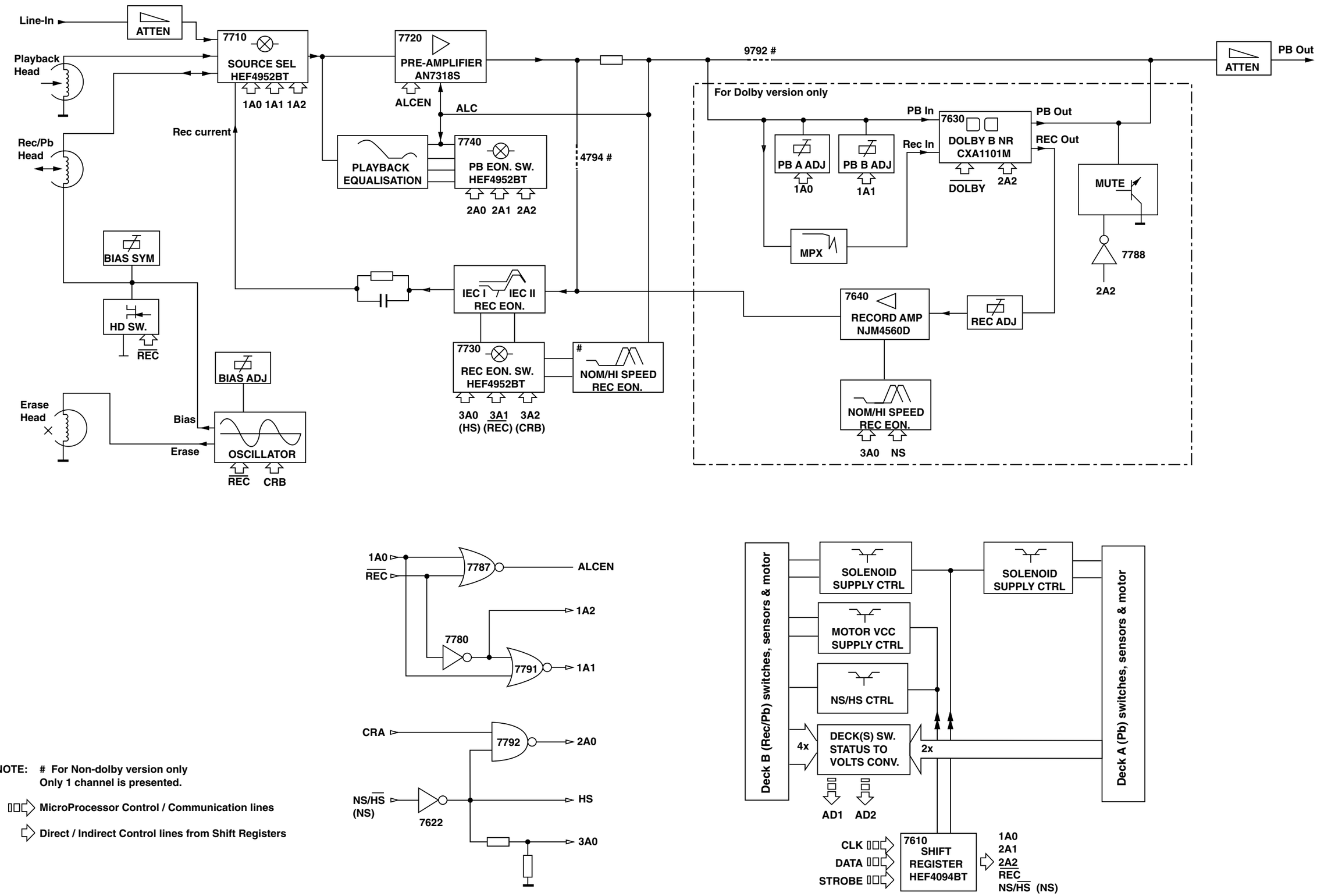
DB = Dolby B NR
DD = Double Deck
FF = Non-Autoreverse
FR = Autoreverse Deck B
ND = Non-Dolby
SD = Single Deck

Variations table for Analog Circuit

| | Autoreverse | Non-autoreverse |
|---|---|---|
| | ND/DD/FR | ND/DD/FF |
| 2701 , 2702 | 150pF | 270pF |
| 2703 , 2704 | 100pF | 220pF |
| 2717 , 2718 | 10nF | 15nF |
| 2727 , 2728 | 470pF | 1nF |
| 3616 | 10k | 1k |
| 3618 | 6k8 | - |
| 3620 | 10k trimmer | - |
| 3622 | - | 10k trimmer |
| 3672 | 4k7 | - |
| 3676 | 47k | - |
| 3688 | 680R | - |
| 3723 , 3724 | 15k | 18k |
| 3727 , 3728 | 5k6 | 6k8 |
| 3729 , 3730 | 3k3 | 4k7 |
| 3743 , 3744 | 1k5 | 2k2 |
| 3745 , 3746 | 3k3 | 5k6 |
| 3754 , 3755 | 1M | 47R |
| 3769 | 12k | 8k2 |
| 3772 | 6k8 | 5k6 |
| 3774 | 15k | 8k2 |
| 6614 | 1N4148 | - |
| 7616 | BC857B | - |
| 7622 | BC847B | - |

9-2

## BLOCK DIAGRAM










NOTE: # For Non-dolby version only
Only 1 channel is presented.

MicroProcessor Control / Communication lines

Direct / Indirect Control lines from Shift Registers

9-3

## Brief introduction

**General**

1. Playback Mode
   Signal from the playback head Deck A or Deck B is selected and fed through by the Mode Selector IC7710 (HEF4952BT). The signal is amplified by amplifier IC7720 (AN7323S) before feeding to the IC7740 (HEF4952BT) and out to the AF Board via connector 1701.

2. Recording Mode
   Recording Signal is selected and fed through by the Mode Selector IC7710 (HEF4952BT) which is then amplified by the amplifier IC7720 (AN7323S). The amplified output signal will pass through IC7730 (HEF4952BT) for record equalization and back to IC7710 (HEF4952BT) before registered into the Rec/PB Head of Deck B.

3. Dubbing Mode
   In Dubbing mode, signal from the playback head Deck A is selected and fed through by the Mode Selector IC7710 (HEF4952BT) which is then equalised for playback mode by the amplifier IC7720 (AN7323S) so that a flat response is obtained after the pre-amp. The equalised signal will then follow the same path as in the Recording mode.

4. Mode Selector
   The Mode Selector IC7710 (HEF4952BT) caters for 4 inputs signal, namely Playback Signal from Deck A, Playback Signal from Deck B, Recording Signal and Dubbing Signal.

5. Amplifier PB/REC
   Amplifier IC7720 (AN7323S) is for the purpose of amplifying the Playback and Recording signal from the Mode Selector.

6. Automatic Level Control (ALC)
   ALC circuit consists of resistors (3760, 3765, 3766, 3767), capacitors (2762 , 2763) and control by transistor 7787 (BC847B). ALC limits the amplifier output to a constant value when input signal becomes too large, thus limiting recording current to below saturation level, to prevent recording distortion.

7. Muting Circuit (For Non-Dolby version only)
   Switch S4 of the IC7740 (HEF4952BT) is for the purpose of muting the output during Recording mode. During Recording mode, S4 is closed and shorted to the ground.

8. IC7740 (HEF4952BT)
   The function of the IC7740 (HEF4952BT) is to change time constant between 120us Ferro (IEC I) and 70us Chrome (IEC II) during playback mode. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II). This IC will switch to Flat Gain during the Recording mode.

9. IC7730 (HEF4952BT)
   The function of the IC7730 (HEF4952BT) is to change gain and time constant according to tape type and recording speed to boost recording current at higher frequency during recording to compensate for head loss. It will automatically determined whether the tape type is 120us Ferro (IEC I ) or 70us Chrome (IEC II).

10. Bias Level
    Bias Level making use of the Variable resistor (3773) for adjusting the optimal level of the bias current for Ferro or Chrome.

11. Bias Symm (For Dolby B NR version only)
    Bias Symm making use of the Variable resistor (3785) to adjust the bias current for the left and the right channel to be equal.

12. PB Switch
    Playback Switch which consists of the FETs 7785 (For Dolby B NR version only) & 7786 (J111) is for the purpose of providing a virtual ground for the Rec/PB Head (Deck B) during Playback mode. During the Playback mode, the FETs are turn on and shorted pin 2 and 4 of connector 1720 to the ground. During Recording mode, the FETs are turn off to allow the oscillator signal to be superposition onto the Recording signal for recording.

13. Motor Speed (For FR versions only)
    During High speed dubbing, a feedback signal from the uP through pin 03 of the IC7610 (HEF4094BT) will trigger the transistors 7622 (BC847B) and 7616 (BC857B) to cause a change in the voltage level between High and Low, thus changing the speed of the motor.

14. IC7610 (HEF4094BT)
    IC7610 (HEF4094BT) is a Shift Register use for issues the logic for cmos switch ICs (HEF4952BT) via 1A0, 2A1 and 2A2. It also issues logic to On/Off SOL_A, SOL_B and MOT. Recording speed is controlled via NS/HS.

**Dolby Circuit (For sets with Dolby B NR version only)**

15. IC7630 (CXA1551M)
    IC7630 (CXA1551M) in the Dolby circuit is a Dolby Noise Reduction Type B IC for the Playback and Recording signal. Noise Reduction ON/OFF are controlled by $\overline{\text{DOLBY}}$, which is from CLK, direct from uP. After clocking in DATA, CLK is set to HIGH/ LOW for NR OFF/ON.

16. 19kHz Filter
    The 19kHz filters 5631 & 5632 (LXD-210) in the Dolby circuit is for the purpose of filtering the 19kHz Pilot Tone (for Tuner signal only) of the Recording signal.

17. Level Adjust
    The Variable resistor 3635, 3636,3641 and 3642 in the Dolby circuit is for adjusting the playback level of the Dolby reference (400Hz , 200nWb/m). Transistor 7631, 7632 are ON to enable adjustment of 3641, 3642 during Playback Deck A. Transistor 7633, 7634 and 3635, 3636 are active for Playback Deck B.

18. Amplifier IC7640 (NJM4560M)
    The Amplifiers 7640A & 7640B (NJM4560M) in the Dolby circuit is for the purpose of amplified the Recording signal.

19. Muting Circuit
    The muting circuit which consists of transistors 7788, 7789 and 7790 (BC847B) is for the purpose of muting the output during Recording mode.

**NOTATIONS & ABBREVIATIONS USED IN THIS DOCUMENT**

| | |
|---|---|
| CR | Chrome (IEC type II) |
| DB | Dolby NR type B |
| DD | Double Deck |
| DM | Double Motor |
| FE | Ferro (IEC type I) |
| FF | Non-Autoreverse |
| FR | Autoreverse Deck B |
| Gnd x | Ground x |
| HSD | High speed dubbing |
| ND | Non Dolby |
| NR | Noise Reduction |
| NSD | Normal speed dubbing |
| PB | Playback |
| REC | Record |
| S/A | Sub-assy |
| SD | Single Deck |
| SM | Single Motor |

## CONNECTORS ASSIGNMENTS:

CONNECTOR 1701 — INTERCONNECTION TO AF BOARD

| | | |
|---|---|---|
| 1 | REC-L | Record input left |
| 2 | REC-R | Record input right |
| 3 | GND A | AF Ground |
| 4 | TAPE-L | Playback output left |
| 5 | +12V | D.C. supply (+12V) for AF electronics |
| 6 | TAPE-R | Playback output right |
| 7 | -CMOS | Negative d.c. supply (-9V) for CMOS ICs |

CONNECTOR 1703 — INTERCONNECTION TO AF BOARD

| | | |
|---|---|---|
| 1 | GND M | Motor Ground |
| 2 | +MOTOR | D.C. supply (+12V) for tape deck motor & solenoid |

CONNECTOR 1706 — INTERCONNECTION TO FRONT BOARD

| | | |
|---|---|---|
| 1 | AD2 | Deck sensing switches output voltage / Deck A EOT |
| 2 | AD1 | Deck sensing switches output voltage / Deck B EOT |
| 3 | +5V | DC supply +5V for ADC network |
| 4 | GND P | Control & Oscillator Ground |
| 5 | CLK | HEF4094BT shift register Clock line |
| 6 | DATA | HEF4094BT shift register Data line |
| 7 | STROBE | HEF4094BT shift register Strobe line |

CONNECTOR 1710 — DECK B HEADS CONNECTON ***(For Non-Dolby version only)***

| | | |
|---|---|---|
| 1 | B R/P HD L+ | R/P Head left channel positive |
| 2 | GND A | R/P Head return ground |
| 3 | B R/P HD R+ | R/P Head right channel positive |
| 4 | ERASE HEAD | Erase Head |
| 5 | GND A | Erase Head ground |

CONNECTOR 1720 — DECK B HEADS CONNECTON ***(For Dolby B NR version only)***

| | | |
|---|---|---|
| 1 | B R/P HD L+ | R/P Head left channel positive |
| 2 | B R/P HD L- | R/P Head left channel negative |
| 3 | B R/P HD R+ | R/P Head right channel positive |
| 4 | B R/P HD R- | R/P Head right channel negative |
| 5 | ERASE HEAD | Erase Head |
| 6 | GND A | Erase Head ground |

CONNECTOR 1730 — DECK A HEAD CONNECTIONS ***(For Double Deck versions only)***

| | | |
|---|---|---|
| 1 | A PB HD L+ | Pb Head left channel positive |
| 2 | GND A | Pb Head return ground shield |
| 3 | A PB HD R+ | Pb Head right channel positive |



9-4

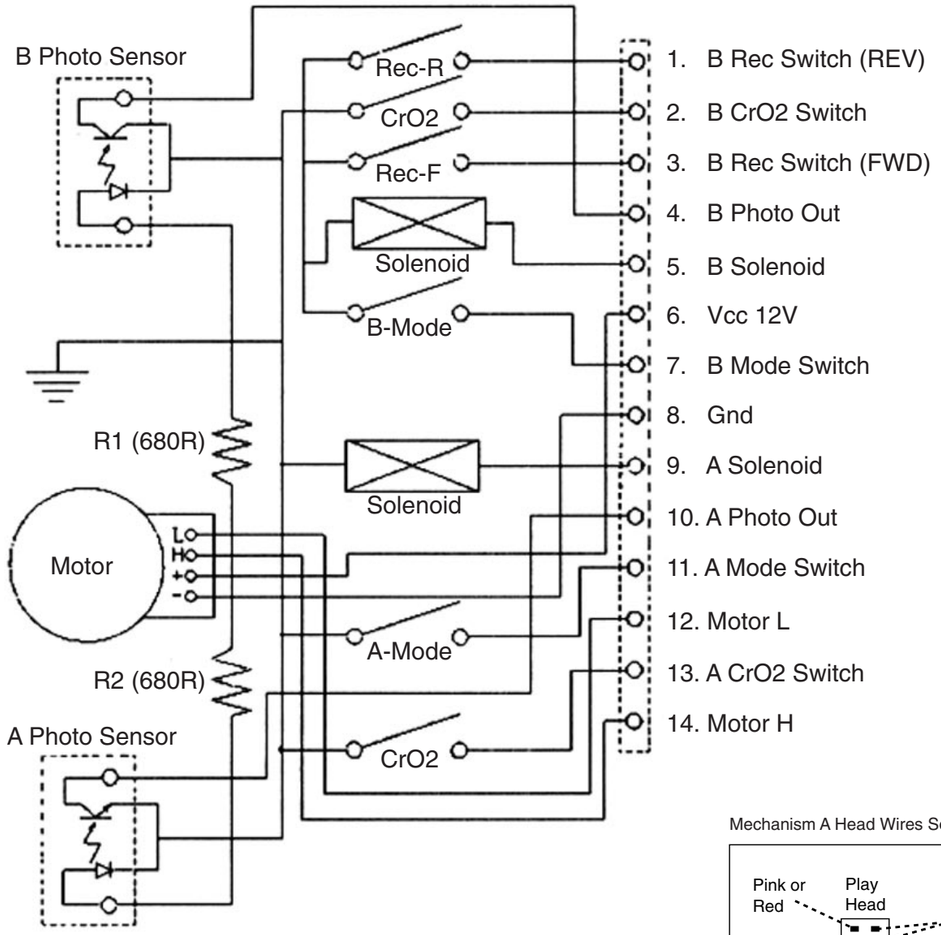
CONNECTOR 1740 — DECK A & B CONTROL INTERFACE ***(For Dolby B NR version only)***

| | | | |
|---|---|---|---|
| 1 | REC REW | Record tab protection status switch (reverse) | [open=on: close=off] |
| 2 | CrO2 B | Chrome tape detection switch deck B | [open=Cr: close=Fe] |
| 3 | REC FWD | Record tab protection status switch (forward) | [open=on: close=off] |
| 4 | PHOTO B | Photo sensor output (tape movement indication) | |
| 5 | SOL B | Solenoid supply for deck B | |
| 6 | Vcc | Deck / Motor supply | |
| 7 | MODE B | Mode switch (head engagement) | [open=off: close=engaged] |
| 8 | GND M | Deck / Motor ground | |
| 9 | SOL A | Solenoid supply for deck A | |
| 10 | PHOTO A | Photo sensor output (tape movement indication) | |
| 11 | MODE A | Mode switch (head engagement) | [open=off: close=engaged] |
| 12 | L | L pin for motor | |
| 13 | CrO2 A | Chrome tape detection switch deck A | [open=Cr: close=Fe] |
| 14 | H | H pin for motor | |

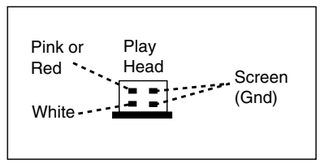
CONNECTOR 1770 — DECK A & B CONTROL INTERFACE ***(For Non-Dolby version only)***

| | | | |
|---|---|---|---|
| 1 | REC REW | Record tab protection status switch (reverse) | [open=on: close=off] |
| 2 | CrO2 B | Chrome tape detection switch deck B | [open=Cr: close=Fe] |
| 3 | REC FWD | Record tab protection status switch (forward) | [open=on: close=off] |
| 4 | PHOTO B | Photo sensor output (tape movement indication) | |
| 5 | SOL B | Solenoid supply for deck B | |
| 6 | Vcc | Deck / Motor supply | |
| 7 | MODE B | Mode switch (head engagement) | [open=off: close=engaged] |
| 8 | GND M | Deck / Motor ground | |
| 9 | SOL A | Solenoid supply for deck A | |
| 10 | PHOTO A | Photo sensor output (tape movement indication) | |
| 11 | MODE A | Mode switch (head engagement) | [open=off: close=engaged] |
| 12 | L | L pin for motor | |
| 13 | CrO2 A | Chrome tape detection switch deck A | [open=Cr: close=Fe] |
| 14 | H | H pin for motor | |

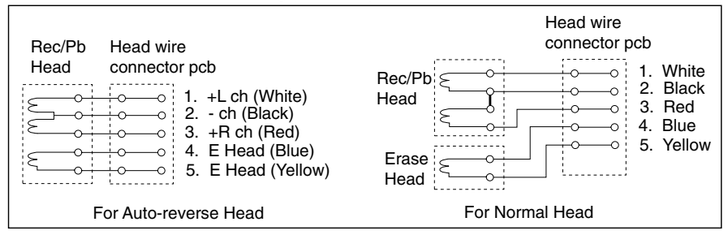
## TAPE MECHANISM ELECTRONICS



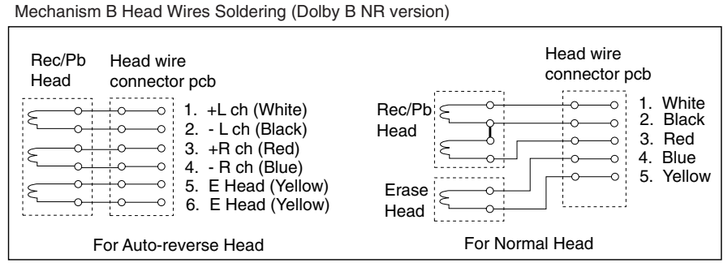

Mechanism A Head Wires Soldering




Mechanism B Head Wires Soldering (Non-Dolby version)




Mechanism B Head Wires Soldering (Dolby B NR version)




9-5

## TAPE ADJUSTMENT & CHECK TABLE

| | TEST CASSETTE | RECORDER MODE | MEASURE ON | READ ON | ADJUST with | ADJUST to |
|---|---|---|---|---|---|---|
| ***ADJUST MOTOR SPEED*** | | | | | | |
| NORMAL SPEED | SBC420 3150Hz | PLAY B | ◇1 or ◇2 LEFT RIGHT | frequency counter | 3620 | 3150Hz ± 0.5% |
| | | PLAY A | | | check | 3150Hz -0.8/+1.8% |
| ***CHECK WOW & FLUTTER*** | | | | | | |
| DECK A & B | SBC420 3150Hz | PLAY | ◇1 or ◇2 LEFT RIGHT | W&F-meter | check | ≤0.4 % DIN |
| ***ADJUST AZIMUTH*** | | | | | | |
| DECK A & B | SBC420 10kHz | PLAY FWD | ◇1 or ◇2 LEFT RIGHT | mV-meter | left hand screw | max. output level & left=right |
| | | PLAY REV # | | | right hand screw | |
| ***CHECK PLAYBACK FREQUENCY RESPONSE*** | | | | | | |
| DECK A & B | SBC420 | PLAY | ◇1 or ◇2 LEFT RIGHT | mV-meter | check | limits see fig.1 |
| ***ADJUST BIAS CURRENT*** | | | | | | |
| DECK B | SBC419A | RECORD | ◇5 or ◇6 LEFT RIGHT | mV-meter | 3773 | 995mV |
| | SBC420 | | | | check | 750mV ± 1.5dB |
| ***CHECK OVERALL FREQUENCY RESPONSE AND DISTORTION*** | | | | | | |
| Inject 3mV signals 100Hz, 250Hz, 1kHz, 10kHz, 12.5kHz via ◇3 or ◇4 | SBC419A or SBC420 | RECORD B | | | | |
| | RECORDED CASSETTE | PLAY B | ◇1 or ◇2 LEFT RIGHT | mV-meter | check | limits see fig. 2 * |
| Inject 1kHz 8.85mV via ◇3 or ◇4 | SBC419A or SBC420 | RECORD B | | | | |
| | RECORDED CASSETTE | PLAY B | ◇1 or ◇2 LEFT RIGHT | THD-meter | check | ≤3% * |

SBC419A : 4822 397 30069
SBC420 : 4822 397 30071

\# For Auto-reverse version only
* If high frequencies are not within limits, decrease bias and re-measure. If distortion is too high, increase bias and re-meaure

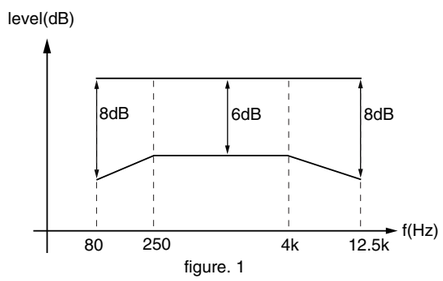


figure. 1

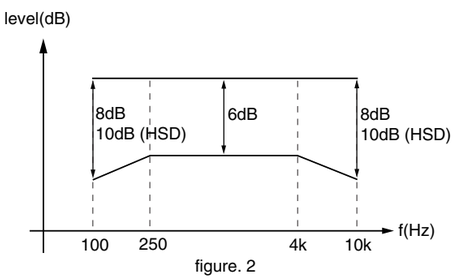
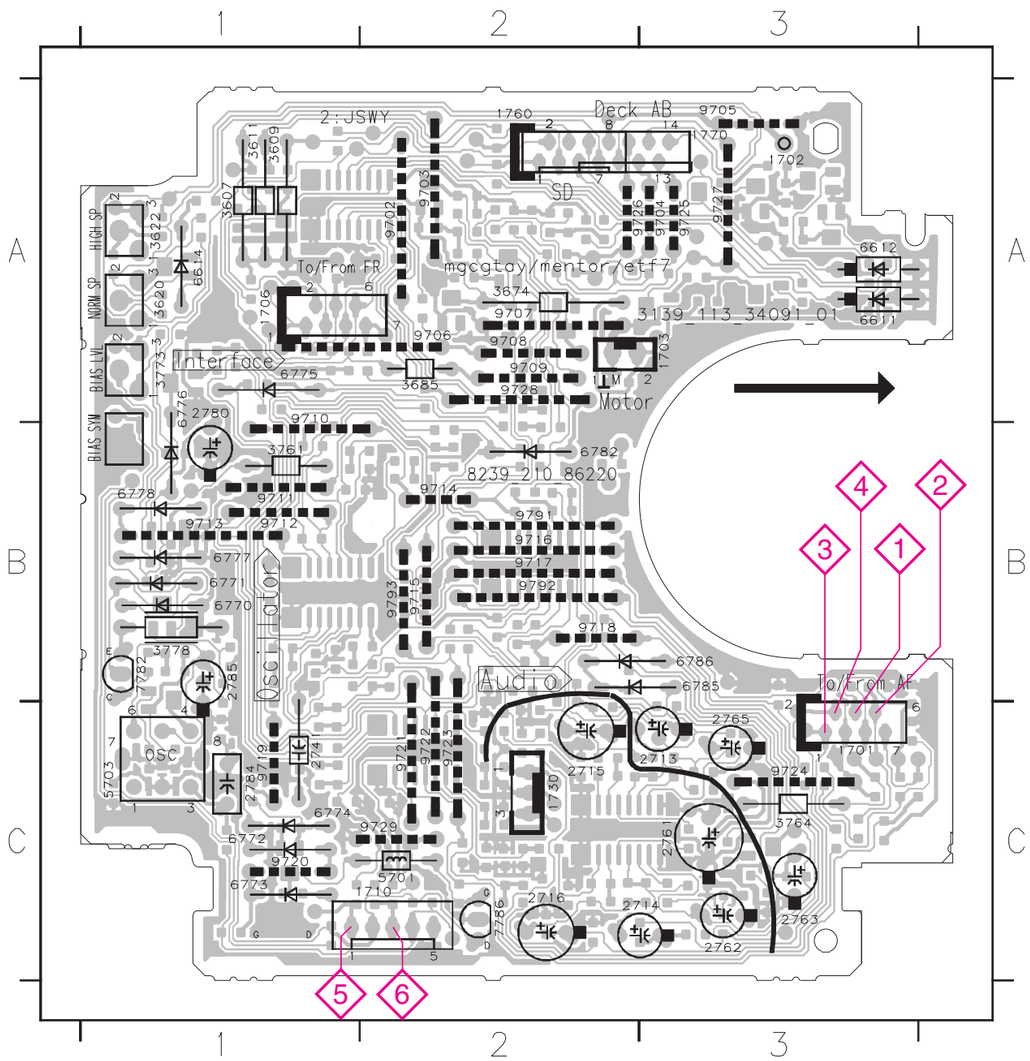


figure. 2

## COMPONENT LAYOUT

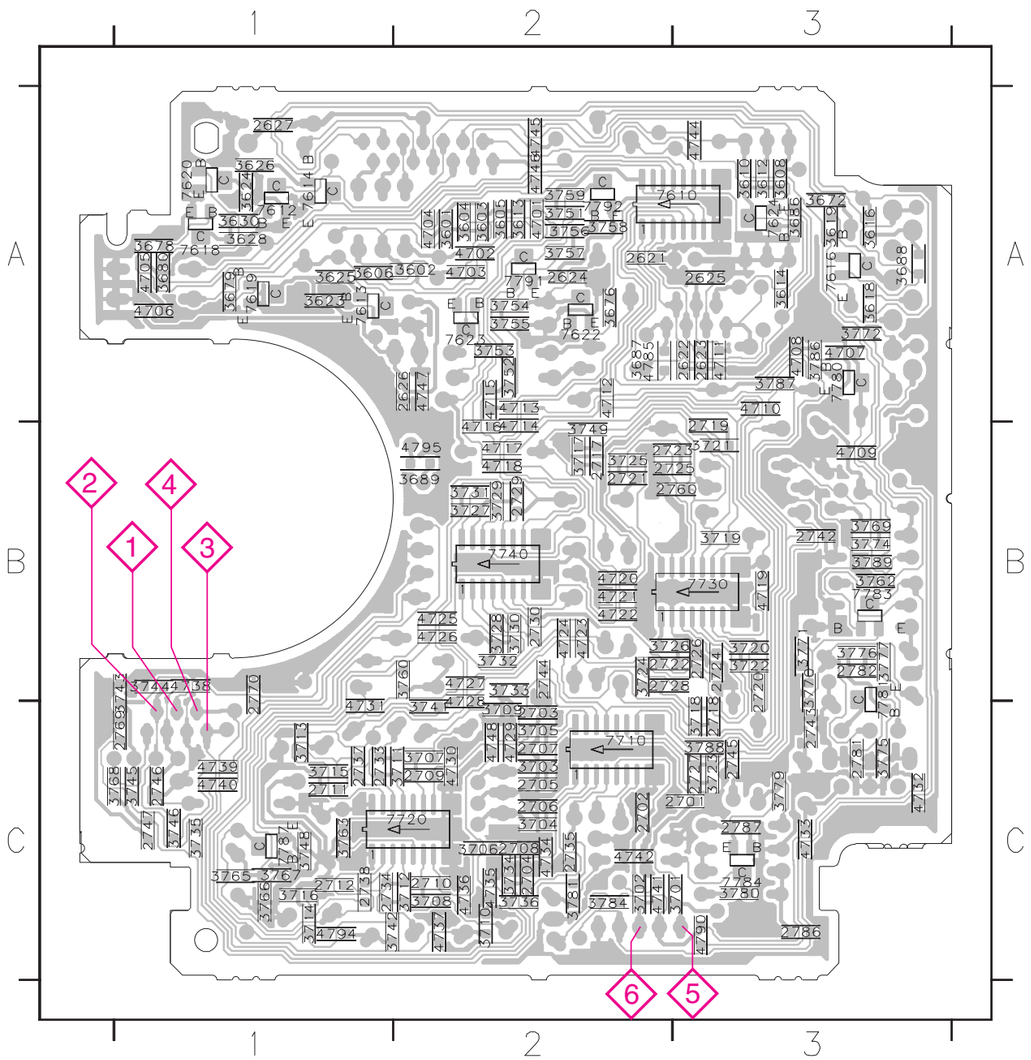
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1701 C3 | 2715 C2 | 3607 A1 | 3778 B1 | 6774 C1 | 9702 A2 | 9712 B1 | 9722 C2 | 9793 B2 |
| 1702 A3 | 2716 C2 | 3609 A1 | 5701 C2 | 6775 A1 | 9703 A2 | 9713 B1 | 9723 C2 | |
| 1703 A3 | 2741 C1 | 3611 A1 | 5703 C1 | 6776 A1 | 9704 A3 | 9714 B2 | 9724 C3 | |
| 1706 A1 | 2761 C3 | 3620 A1 | 6611 A3 | 6777 B1 | 9705 A3 | 9715 B2 | 9725 A3 | |
| 1710 C2 | 2762 C3 | 3622 A1 | 6612 A3 | 6778 B1 | 9706 A2 | 9716 B2 | 9726 A2 | |
| 1730 C2 | 2763 C3 | 3674 A2 | 6614 A1 | 6782 B2 | 9707 A2 | 9717 B2 | 9727 A3 | |
| 1760 A2 | 2765 C3 | 3685 A2 | 6770 B1 | 6785 B3 | 9708 A2 | 9718 B2 | 9728 A2 | |
| 1770 A3 | 2780 A1 | 3761 B1 | 6771 B1 | 6786 B3 | 9709 A2 | 9719 C1 | 9729 C2 | |
| 2713 C3 | 2784 C1 | 3764 C3 | 6772 C1 | 7782 B1 | 9710 A1 | 9720 C1 | 9791 B2 | |
| 2714 C3 | 2785 B1 | 3773 A1 | 6773 C1 | 7786 C2 | 9711 B1 | 9721 C2 | 9792 B2 | |






## CHIP LAYOUT

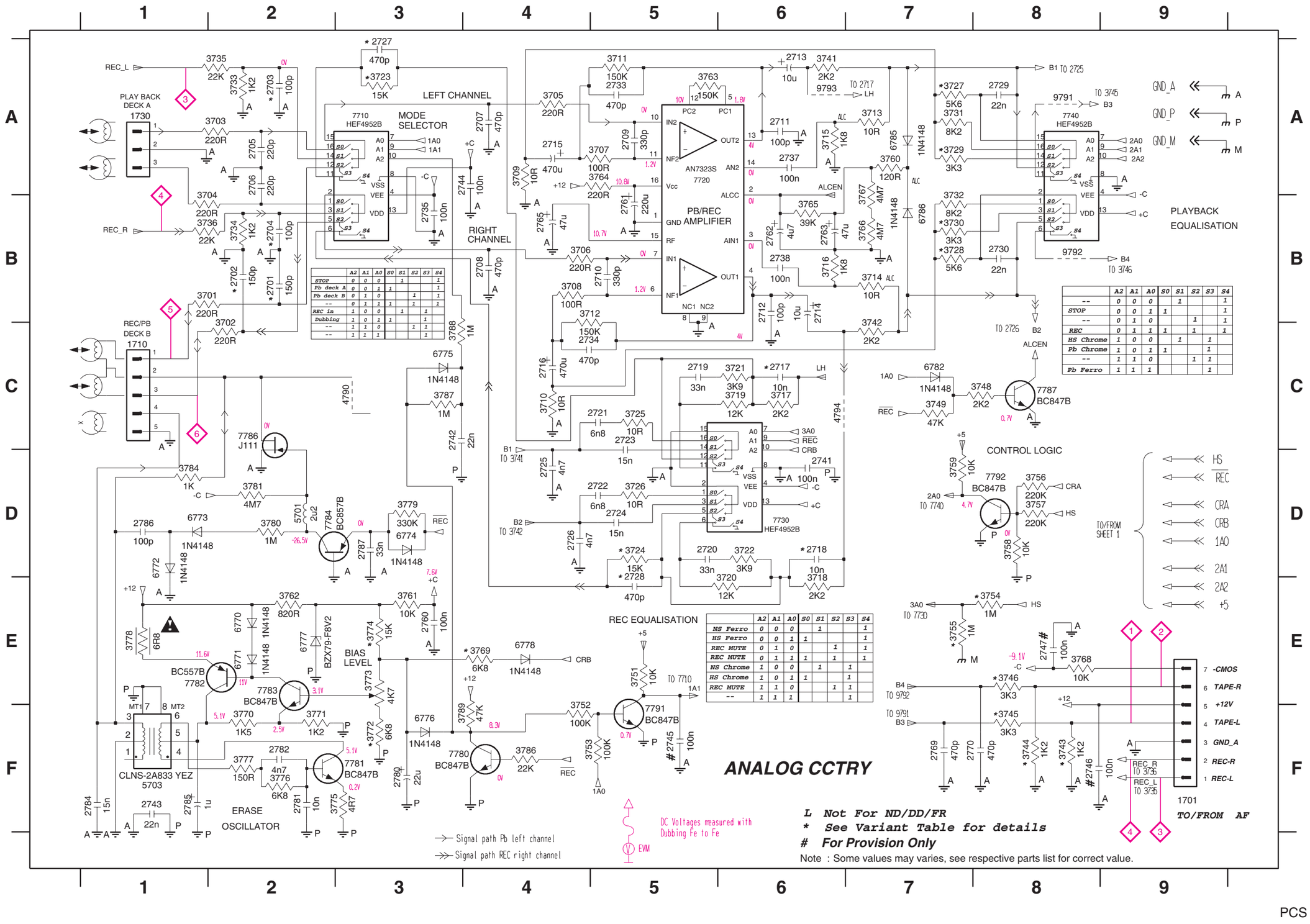
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2621 A2 | 2724 B3 | 3602 A2 | 3688 A3 | 3725 B2 | 3757 A2 | 4701 A2 | 4727 B2 | 7612 A1 |
| 2622 A3 | 2725 B3 | 3603 A2 | 3689 B2 | 3726 B2 | 3758 A2 | 4702 A2 | 4728 C2 | 7613 A1 |
| 2623 A3 | 2726 B3 | 3604 A2 | 3701 C3 | 3727 B2 | 3759 A2 | 4703 A2 | 4729 C2 | 7614 A1 |
| 2624 A2 | 2727 C3 | 3605 A2 | 3702 C2 | 3728 B2 | 3760 B2 | 4704 A2 | 4730 C2 | 7616 A3 |
| 2625 A3 | 2728 B2 | 3606 A1 | 3703 C2 | 3729 B2 | 3762 B3 | 4705 A1 | 4731 C1 | 7618 A1 |
| 2626 A2 | 2729 B2 | 3608 A3 | 3704 C2 | 3730 B2 | 3763 C1 | 4706 A1 | 4732 C3 | 7619 A1 |
| 2627 A1 | 2730 B2 | 3610 A3 | 3705 C2 | 3731 B2 | 3765 C1 | 4707 A3 | 4733 C3 | 7620 A1 |
| 2701 C3 | 2733 C1 | 3612 A3 | 3706 C2 | 3732 B2 | 3766 C1 | 4708 A3 | 4734 C2 | 7622 A2 |
| 2702 C2 | 2734 C1 | 3613 A2 | 3707 C2 | 3733 B2 | 3767 C1 | 4709 B3 | 4735 C2 | 7623 A2 |
| 2703 C2 | 2735 C2 | 3614 A3 | 3708 C2 | 3734 C2 | 3768 C1 | 4710 A3 | 4736 C2 | 7624 A3 |
| 2704 C2 | 2737 C1 | 3616 A3 | 3709 C2 | 3735 C1 | 3769 B3 | 4711 A3 | 4737 C2 | 7710 C2 |
| 2705 C2 | 2738 C1 | 3618 A3 | 3710 C2 | 3736 C2 | 3770 B3 | 4712 A2 | 4738 B1 | 7720 C2 |
| 2706 C2 | 2742 B3 | 3619 A3 | 3711 C2 | 3741 C2 | 3771 B3 | 4713 A2 | 4739 C1 | 7730 B3 |
| 2707 C2 | 2743 C3 | 3623 A1 | 3712 C2 | 3742 C1 | 3772 A3 | 4714 B2 | 4740 C1 | 7740 B2 |
| 2708 C2 | 2744 B2 | 3624 A1 | 3713 C1 | 3743 B1 | 3774 B3 | 4715 A2 | 4741 C2 | 7780 A3 |
| 2709 C2 | 2745 C3 | 3625 A1 | 3714 C1 | 3744 B1 | 3775 C3 | 4716 B2 | 4742 C2 | 7781 B3 |
| 2710 C2 | 2746 C1 | 3626 A1 | 3715 C1 | 3745 C1 | 3776 B3 | 4717 B2 | 4744 A3 | 7783 B3 |
| 2711 C1 | 2747 C1 | 3628 A1 | 3716 C1 | 3746 C1 | 3777 B3 | 4718 B2 | 4745 A2 | 7784 C3 |
| 2712 C1 | 2760 B3 | 3630 A1 | 3717 B2 | 3748 C1 | 3779 C3 | 4719 B3 | 4746 A2 | 7787 C1 |
| 2717 B2 | 2769 C1 | 3672 A3 | 3718 C3 | 3749 B2 | 3780 C3 | 4720 B2 | 4747 A2 | 7791 A2 |
| 2718 C3 | 2770 B1 | 3676 A2 | 3719 B3 | 3751 A2 | 3781 C2 | 4721 B2 | 4748 C2 | 7792 A2 |
| 2719 B3 | 2781 C3 | 3678 A1 | 3720 B3 | 3752 A2 | 3784 C2 | 4722 B2 | 4785 A2 | |
| 2720 B3 | 2782 B3 | 3679 A1 | 3721 B3 | 3753 A2 | 3786 A3 | 4723 B2 | 4790 C3 | |
| 2721 B2 | 2786 C3 | 3680 A1 | 3722 B3 | 3754 A2 | 3787 A3 | 4724 B2 | 4794 C1 | |
| 2722 B2 | 2787 C3 | 3686 A3 | 3723 C3 | 3755 A2 | 3788 C3 | 4725 B2 | 4795 B2 | |
| 2723 B2 | 3601 A2 | 3687 A2 | 3724 B2 | 3756 A2 | 3789 B3 | 4726 B2 | 7610 A3 | |



9-7

## ANALOG CIRCUIT

1701 F9 2705 A2 2712 B6 2719 C5 2726 D4 2735 B3 2745 F5 2765 B4 2785 F1 3705 A4 3712 B4 3719 C6 3726 D5 3733 A2 3744 F8 3753 F5 3760 A7 3767 A7 3774 E3 3781 D2 4794 C6 6774 D3 6786 B7 7782 E1 9791 A8
1710 C1 2706 A2 2713 A6 2720 D5 2727 A3 2737 A6 2746 F8 2769 F7 2786 D1 3706 B4 3713 A7 3720 E6 3727 A7 3734 B2 3745 F8 3754 E8 3761 E3 3768 E8 3775 F3 3784 D1 5701 D2 6775 C3 7710 A3 7783 E2 9792 B8
1730 A1 2707 A4 2714 B6 2721 C5 2728 E5 2738 B6 2747 E8 2770 F8 2787 D3 3707 A5 3714 B7 3721 C6 3728 B7 3735 A2 3746 E8 3755 E7 3762 E2 3769 E4 3776 F2 3786 F4 5703 F1 6776 F3 7720 A5 7784 D2 9793 A6
2701 B2 2708 B4 2715 A4 2722 D5 2729 A8 2741 D6 2760 E3 2780 F3 3701 B1 3708 B4 3715 A6 3722 D6 3729 A7 3736 B1 3748 C8 3756 D8 3763 A5 3770 F2 3777 F2 3787 C3 6770 E2 6777 E2 7730 D6 7786 C2
2702 B2 2709 A5 2716 C4 2723 C5 2730 B8 2742 C3 2761 B5 2781 F2 3702 C2 3709 A4 3716 B6 3723 A3 3730 B7 3741 A6 3749 C7 3757 D8 3764 A5 3771 F2 3778 E1 3788 C3 6771 E2 6778 E4 7740 A8 7787 C8
2703 A2 2710 B5 2717 C6 2724 D5 2733 A5 2743 F1 2762 B6 2782 F2 3703 A2 3710 C4 3717 C6 3724 D5 3731 A7 3742 C7 3751 E5 3758 D8 3765 B6 3772 F3 3779 D3 3789 F4 6772 D1 6782 C7 7780 F4 7791 F5
2704 B2 2711 A6 2718 D6 2725 D4 2734 C4 2744 A4 2763 B6 2784 F1 3704 B1 3711 A5 3718 E6 3725 C5 3732 B7 3743 F8 3752 F4 3759 D7 3766 B7 3773 E3 3780 D2 4790 C3 6773 D1 6785 A7 7781 F3 7792 D8




| | A2 | A1 | A0 | S0 | S1 | S2 | S3 | S4 |
|---|---|---|---|---|---|---|---|---|
| STOP | 0 | 0 | 0 | | 1 | | | 1 |
| Pb deck A | 0 | 0 | 1 | 1 | | | | 1 |
| Pb deck B | 0 | 1 | 0 | | | 1 | | 1 |
| -- | 0 | 1 | 1 | 1 | | 1 | | 1 |
| REC in | 1 | 0 | 0 | | 1 | | 1 | |
| Dubbing | 1 | 0 | 1 | 1 | | | 1 | |
| -- | 1 | 1 | 0 | | | 1 | 1 | |
| -- | 1 | 1 | 1 | | | | 1 | |

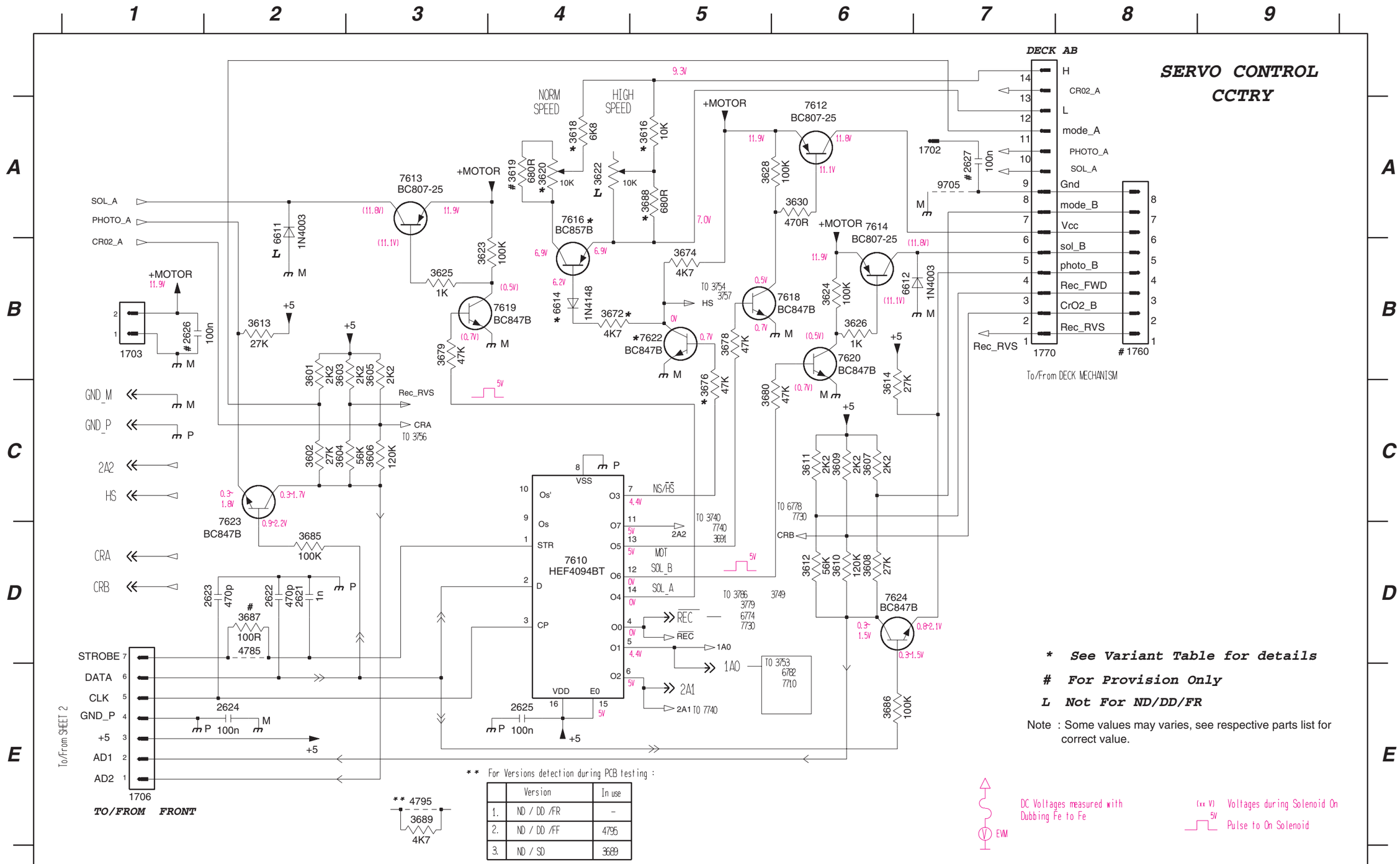
| | A2 | A1 | A0 | S0 | S1 | S2 | S3 | S4 |
|---|---|---|---|---|---|---|---|---|
| -- | 0 | 0 | 0 | | 1 | | | 1 |
| STOP | 0 | 0 | 1 | 1 | | | | 1 |
| -- | 0 | 1 | 0 | | | 1 | | 1 |
| REC | 0 | 1 | 1 | 1 | | 1 | | 1 |
| HS Chrome | 1 | 0 | 0 | | 1 | | 1 | |
| Pb Chrome | 1 | 0 | 1 | 1 | | | 1 | |
| -- | 1 | 1 | 0 | | | 1 | 1 | |
| Pb Ferro | 1 | 1 | 1 | | | | 1 | |

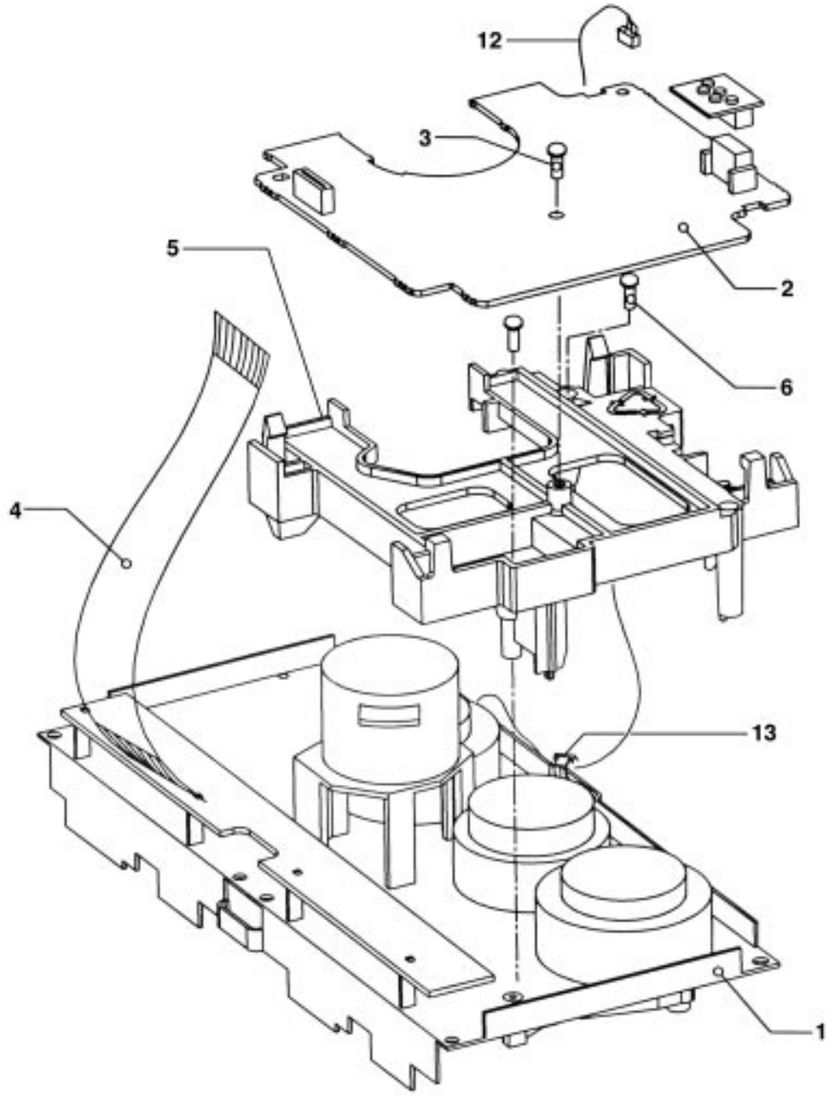
| | A2 | A1 | A0 | S0 | S1 | S2 | S3 | S4 |
|---|---|---|---|---|---|---|---|---|
| NS Ferro | 0 | 0 | 0 | | 1 | | | 1 |
| HS Ferro | 0 | 0 | 1 | 1 | | | | 1 |
| REC MUTE | 0 | 1 | 0 | | | 1 | | 1 |
| REC MUTE | 0 | 1 | 1 | 1 | | 1 | | 1 |
| NS Chrome | 1 | 0 | 0 | | 1 | | 1 | |
| HS Chrome | 1 | 0 | 1 | 1 | | | 1 | |
| REC MUTE | 1 | 1 | 0 | | | 1 | 1 | |
| -- | 1 | 1 | 1 | | | | 1 | |

9-8

## SERVO CONTROL CIRCUIT

*1702 A7 1760 B8 2622 D2 2625 E4 3601 B2 3604 C2 3607 C6 3610 D6 3613 B2 3618 A4 3622 A4 3625 B3 3630 A6 3676 C5 3680 C5 3687 D2 4785 D2 6612 B6 7612 A6 7616 A4 7620 B6 7624 D6*
*1703 B1 1770 B7 2623 D2 2626 B1 3602 C2 3605 B3 3608 D6 3611 C6 3614 C6 3619 A4 3623 B3 3626 B6 3672 B4 3678 B5 3685 D2 3688 A5 4795 E3 6614 B4 7610 D4 7613 A3 7618 B6 7622 B5 9705 A7*
*1706 E1 2621 D2 2624 E2 2627 A7 3603 B2 3606 C3 3609 C6 3612 D6 3616 A5 3620 A4 3624 B6 3628 A5 3674 B5 3679 B3 3686 E6 3689 E3 6611 A2 6614 B4 7610 D4 7614 A6 7619 B4 7623 D2*





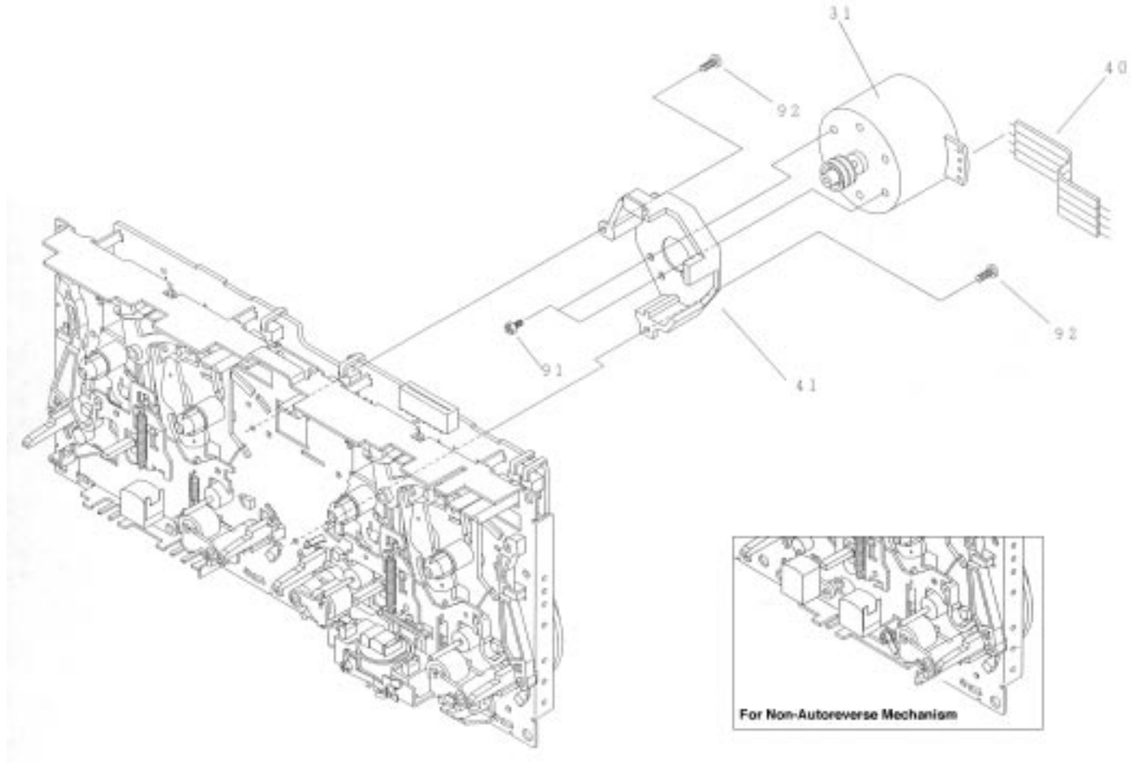

3139 118 77070 (Incl. ...77080) dd wk926

### *TAPE MODULE EXPLODED VIEW*

| | | |
|---|---|---|
| 1 | 313911877130 | Autoreverse Mech. CWE44FR01 |
| 1 | 313911877140 | Non-Autoreverse Mech. CWE44FF02 |
| 3 | - | Screw D3 x 10 |
| 6 | - | Screw M2 x 16 |
| 7 | 313911034080 | Flex Cable 14 pin 7,5 cm |

Note: Only the parts mentioned in this list are normal service spare parts.

9-9







### *TAPE MECHANISM - MOTOR EXPLODED VIEW*

| | | |
|---|---|---|
| 31 | 4822 361 11055 | Motor Assembly |
| 91 | - | Screw M2,6 x 5 |
| 92 | - | Screw M2 x 5 |

Note: Only the parts mentioned in this list are normal service spare parts.

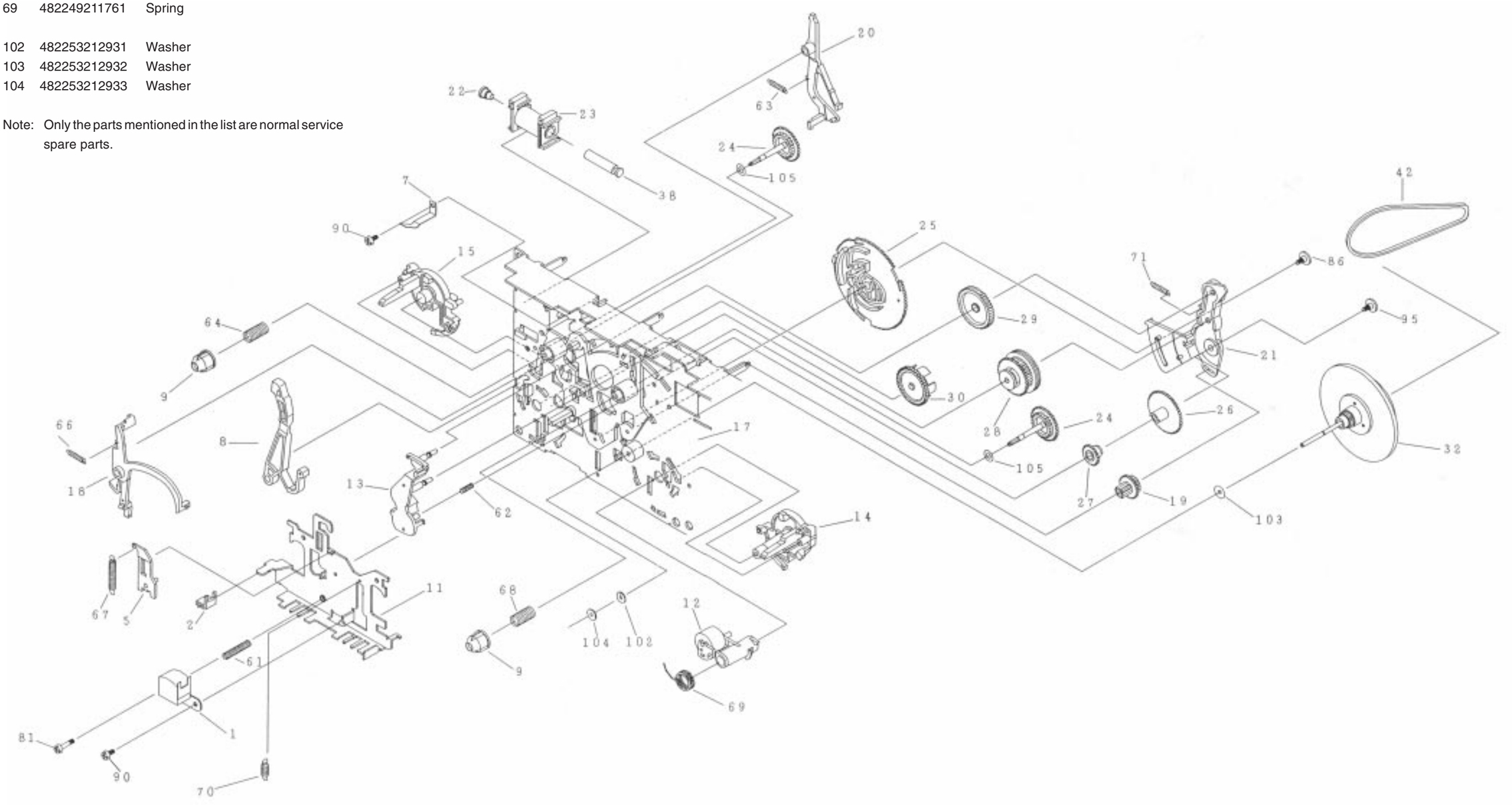
9-10

## TAPE MECHANISM A - PLAY

***MECHANICAL PARTS - PLAY MECHANISM***

| | | |
|---|---|---|
| 1 | 996500002313 | Play Head (Non-Autoreverse deck) |
| 1 | 996500002321 | Play Head (Autoreverse deck) |
| 12 | 482240210972 | Pinch Arm Assembly R |
| 23 | 996500002314 | Coil Assembly |
| | | |
| 32 | 482252811209 | Flywheel Assembly RV |
| 42 | 996500002315 | Belt AF (Autoreverse deck) |
| 42 | 996500002718 | Belt AF (Non-autoreverse deck) |
| 69 | 482249211761 | Spring |
| | | |
| 102 | 482253212931 | Washer |
| 103 | 482253212932 | Washer |
| 104 | 482253212933 | Washer |

Note: Only the parts mentioned in the list are normal service spare parts.



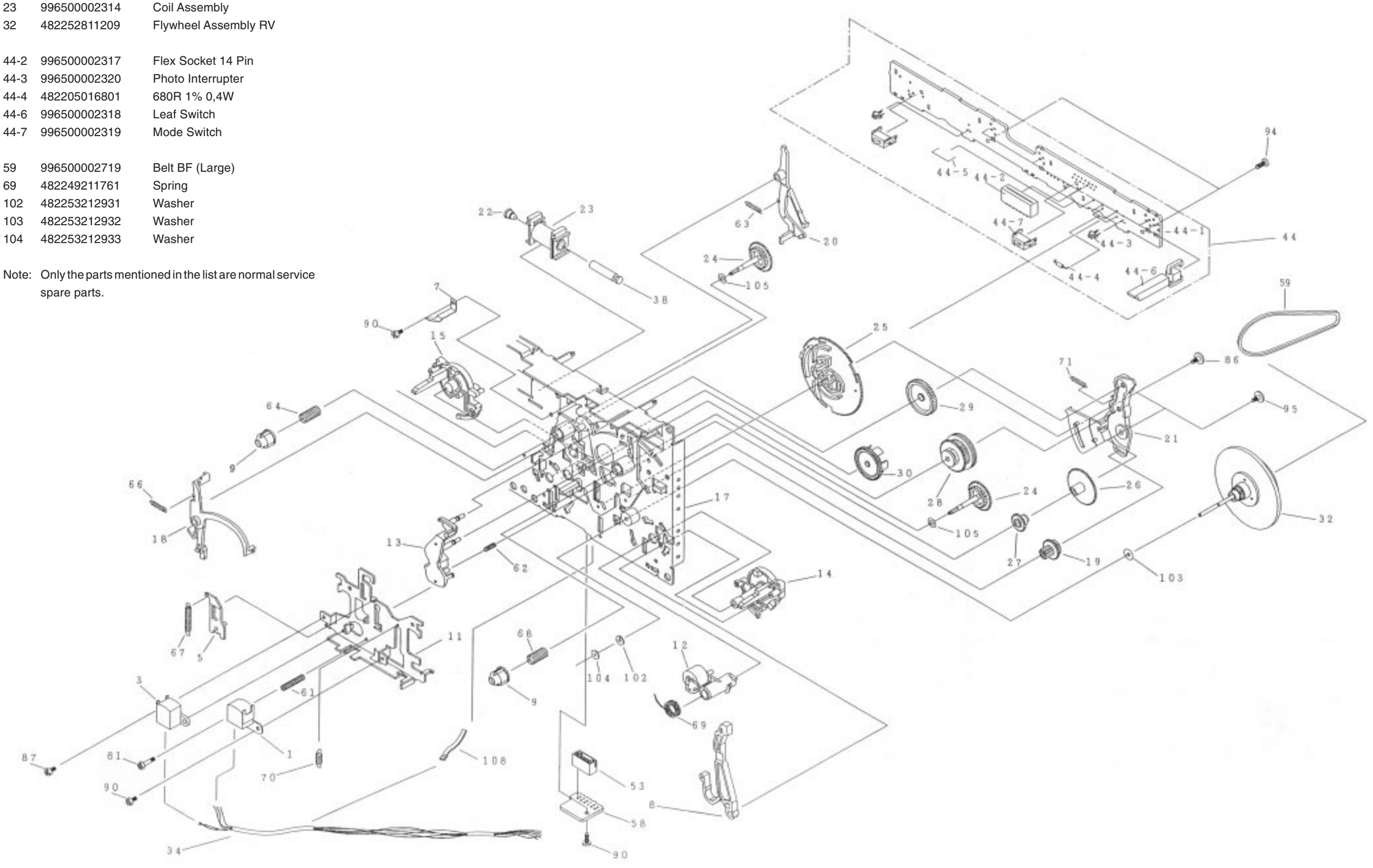
9-11

# TAPE MECHANISM B - RECORD/PLAYBACK *(Non-Autoreverse version)*

***MECHANICAL PARTS - REC/PB MECHANISM***

| | | |
|---|---|---|
| 1 | 996500002313 | Play Head |
| 3 | 996500002600 | Head, Erase |
| 12 | 482240210972 | Pinch Arm Assembly R |
| 23 | 996500002314 | Coil Assembly |
| 32 | 482252811209 | Flywheel Assembly RV |
| | | |
| 44-2 | 996500002317 | Flex Socket 14 Pin |
| 44-3 | 996500002320 | Photo Interrupter |
| 44-4 | 482205016801 | 680R 1% 0,4W |
| 44-6 | 996500002318 | Leaf Switch |
| 44-7 | 996500002319 | Mode Switch |
| | | |
| 59 | 996500002719 | Belt BF (Large) |
| 69 | 482249211761 | Spring |
| 102 | 482253212931 | Washer |
| 103 | 482253212932 | Washer |
| 104 | 482253212933 | Washer |

Note: Only the parts mentioned in the list are normal service spare parts.



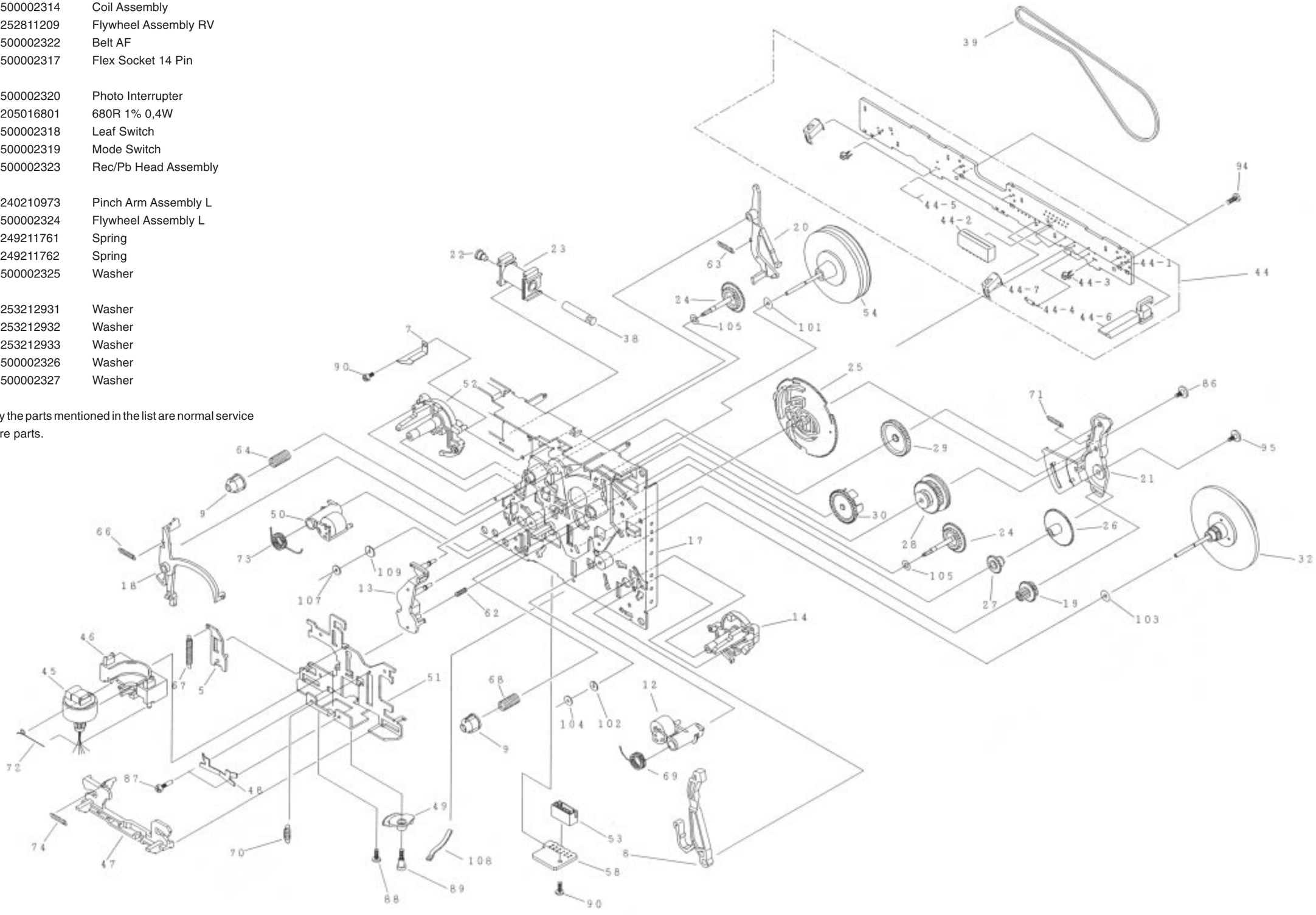
9-12

# TAPE MECHANISM B - RECORD/PLAYBACK *(Autoreverse version)*

***MECHANICAL PARTS - REC/PB MECHANISM***

| | | |
|---|---|---|
| 12 | 482240210972 | Pinch Arm Assembly R |
| 23 | 996500002314 | Coil Assembly |
| 32 | 482252811209 | Flywheel Assembly RV |
| 39 | 996500002322 | Belt AF |
| 44-2 | 996500002317 | Flex Socket 14 Pin |
| 44-3 | 996500002320 | Photo Interrupter |
| 44-4 | 482205016801 | 680R 1% 0,4W |
| 44-6 | 996500002318 | Leaf Switch |
| 44-7 | 996500002319 | Mode Switch |
| 45 | 996500002323 | Rec/Pb Head Assembly |
| 50 | 482240210973 | Pinch Arm Assembly L |
| 54 | 996500002324 | Flywheel Assembly L |
| 69 | 482249211761 | Spring |
| 73 | 482249211762 | Spring |
| 101 | 996500002325 | Washer |
| 102 | 482253212931 | Washer |
| 103 | 482253212932 | Washer |
| 104 | 482253212933 | Washer |
| 107 | 996500002326 | Washer |
| 109 | 996500002327 | Washer |

Note: Only the parts mentioned in the list are normal service spare parts.



9-13

## ELECTRICAL PARTS LIST - ETF7 NON-DOLBY BOARD

ELECTRICAL PARTS LIST - ETF7 NON-DOLBY BOARD

### MISCELLANEOUS

| | | |
|---|---|---|
| 1701 | 482226710953 | Flex Socket 7pin Vert. |
| 1706 | 482226710953 | Flex Socket 7pin Vert. |
| 1770 | 482226751255 | Flex Socket 14pin Vert. |

### CAPACITORS

| | | | |
|---|---|---|---|
| 2621 | 532212231647 | 1nF 10% 63V | |
| 2622 | 532212234099 | 470pF 10% 63V | |
| 2623 | 532212234099 | 470pF 10% 63V | |
| 2624 | 482212614585 | 100nF 10% 50V | |
| 2625 | 482212614585 | 100nF 10% 50V | |
| 2701 | 532212233538 | 150pF 2% 63V | Autoreverse |
| 2701 | 482212233216 | 270pF 5% 63V | Non-autoreverse |
| 2702 | 532212233538 | 150pF 2% 63V | Autoreverse |
| 2702 | 482212233216 | 270pF 5% 63V | Non-autoreverse |
| 2703 | 532212232531 | 100pF 5% 50V | Autoreverse |
| 2703 | 482212233575 | 220pF 5% 63V | Non-autoreverse |
| 2704 | 532212232531 | 100pF 5% 50V | Autoreverse |
| 2704 | 482212233575 | 220pF 5% 63V | Non-autoreverse |
| 2705 | 482212233575 | 220pF 5% 63V | |
| 2706 | 482212233575 | 220pF 5% 63V | |
| 2707 | 532212234099 | 470pF 10% 63V | |
| 2708 | 532212234099 | 470pF 10% 63V | |
| 2709 | 532212231863 | 330pF 5% 63V | |
| 2710 | 532212231863 | 330pF 5% 63V | |
| 2711 | 532212232531 | 100pF 5% 50V | |
| 2712 | 532212232531 | 100pF 5% 50V | |
| 2713 | 482212440248 | 10µF 20% 63V | |
| 2714 | 482212440248 | 10µF 20% 63V | |
| 2715 | 482212480195 | 470µF 20% 10V | |
| 2716 | 482212480195 | 470µF 20% 10V | |
| 2717 | 482212233177 | 10nF 20% 50V | Autoreverse |
| 2717 | 482212613188 | 15nF 5% 63V | Non-autoreverse |
| 2718 | 482212233177 | 10nF 20% 50V | Autoreverse |
| 2718 | 482212613188 | 15nF 5% 63V | Non-autoreverse |
| 2719 | 482212612105 | 33nF 5% 50V | |
| 2720 | 482212612105 | 33nF 5% 50V | |
| 2721 | 532212231866 | 6,8nF 10% 63V | |
| 2722 | 532212231866 | 6,8nF 10% 63V | |
| 2723 | 482212613188 | 15nF 5% 63V | |
| 2724 | 482212613188 | 15nF 5% 63V | |
| 2725 | 532212610223 | 4,7nF 10% 63V | |
| 2726 | 532212610223 | 4,7nF 10% 63V | |
| 2727 | 532212234099 | 470pF 10% 63V | Autoreverse |
| 2727 | 532212231647 | 1nF 10% 63V | Non-autoreverse |
| 2728 | 532212234099 | 470pF 10% 63V | Autoreverse |
| 2728 | 532212231647 | 1nF 10% 63V | Non-autoreverse |
| 2729 | 532212232654 | 22nF 10% 63V | |
| 2730 | 532212232654 | 22nF 10% 63V | |
| 2733 | 532212234099 | 470pF 10% 63V | |
| 2734 | 532212234099 | 470pF 10% 63V | |
| 2735 | 482212614585 | 100nF 10% 50V | |
| 2737 | 482212614585 | 100nF 10% 50V | |
| 2738 | 482212614585 | 100nF 10% 50V | |
| 2741 | 482212611585 | 22nF +80/-20% 25V | |
| 2742 | 532212232654 | 22nF 10% 63V | |
| 2743 | 532212232654 | 22nF 10% 63V | |
| 2744 | 482212614585 | 100nF 10% 50V | |
| 2760 | 482212614585 | 100nF 10% 50V | |
| 2761 | 482212480144 | 220µF 20% 25V | |
| 2762 | 482212440769 | 4,7µF 20% 100V | |
| 2763 | 482212440433 | 47µF 20% 25V | |
| 2765 | 482212440433 | 47µF 20% 25V | |
| 2769 | 532212234099 | 470pF 10% 63V | |
| 2770 | 532212234099 | 470pF 10% 63V | |
| 2780 | 482212481151 | 22µF 20% 50V | |
| 2781 | 482212233177 | 10nF 20% 50V | |
| 2782 | 532212610223 | 4,7nF 10% 63V | |
| 2784 | 482212151305 | 15nF 10% 50V | |
| 2785 | 482212421913 | 1µF 20% 63V | |
| 2786 | 532212232531 | 100pF 5% 50V | |
| 2787 | 482212612105 | 33nF 5% 50V | |

### RESISTORS

| | | | |
|---|---|---|---|
| 3601 | 482211711449 | 2k2 1% 0,1W | |
| 3602 | 482205120273 | 27k 5% 0,1W | |
| 3603 | 482211711449 | 2k2 1% 0,1W | |
| 3604 | 482211711148 | 56k 1% 0,1W | |
| 3605 | 482211711449 | 2k2 1% 0,1W | |
| 3606 | 482205120124 | 120k 5% 0,1W | |
| 3607 | 482211652256 | 2k2 5% 0,5W | |
| 3608 | 482205120273 | 27k 5% 0,1W | |
| 3609 | 482211652256 | 2k2 5% 0,5W | |
| 3610 | 482205120124 | 120k 5% 0,1W | |
| 3611 | 482211652256 | 2k2 5% 0,5W | |
| 3612 | 482211711148 | 56k 1% 0,1W | |
| 3613 | 482205120273 | 27k 5% 0,1W | |
| 3614 | 482205120273 | 27k 5% 0,1W | |
| 3616 | 482211710833 | 10k 1% 0,1W | Autoreverse |
| 3616 | 482205110102 | 1k 2% 0,25W | Non-autoreverse |
| 3618 | 482211711507 | 6k8 1% 0,1W | Autoreverse |
| 3620 | 482210011141 | Trimmer 10k 30% 0,1W | Autorev. |
| 3622 | 482210011141 | Trimmer 10k 30% 0,1W | Non-autorev. |
| 3623 | 482211710837 | 100k 1% 0,1W | |
| 3624 | 482211710837 | 100k 1% 0,1W | |
| 3625 | 482205110102 | 1k 2% 0,25W | |
| 3626 | 482205110102 | 1k 2% 0,25W | |
| 3628 | 482211710837 | 100k 1% 0,1W | |
| 3630 | 482205120471 | 470R 5% 0,1W | |
| 3672 | 482205120472 | 4k7 5% 0,1W | Autoreverse |
| 3674 | 482211652283 | 4k7 5% 0,5W | |
| 3676 | 482211710834 | 47k 1% 0,1W | Autoreverse |
| 3678 | 482211710834 | 47k 1% 0,1W | |
| 3679 | 482211710834 | 47k 1% 0,1W | |
| 3680 | 482211710834 | 47k 1% 0,1W | |
| 3685 | 482211652234 | 100k 5% 0,5W | |
| 3686 | 482211710837 | 100k 1% 0,1W | |
| 3688 | 482211710361 | 680R 1% 0,1W | Autoreverse |
| 3701 | 482211711503 | 220R 1% 0,1W | |
| 3702 | 482211711503 | 220R 1% 0,1W | |
| 3703 | 482211711503 | 220R 1% 0,1W | |
| 3704 | 482211711503 | 220R 1% 0,1W | |
| 3705 | 482211711503 | 220R 1% 0,1W | |
| 3706 | 482211711503 | 220R 1% 0,1W | |
| 3707 | 482205120101 | 100R 5% 0,1W | |
| 3708 | 482205120101 | 100R 5% 0,1W | |
| 3709 | 482205120109 | 10R 5% 0,1W | |
| 3710 | 482205120109 | 10R 5% 0,1W | |
| 3711 | 482205120154 | 150k 5% 0,1W | |
| 3712 | 482205120154 | 150k 5% 0,1W | |
| 3713 | 482205120109 | 10R 5% 0,1W | |
| 3714 | 482205120109 | 10R 5% 0,1W | |
| 3715 | 482205120182 | 1k8 5% 0,1W | |
| 3716 | 482205120182 | 1k8 5% 0,1W | |
| 3717 | 482211711449 | 2k2 1% 0,1W | |
| 3718 | 482211711449 | 2k2 1% 0,1W | |
| 3719 | 482211711383 | 12k 1% 0,1W | |
| 3720 | 482211711383 | 12k 1% 0,1W | |
| 3721 | 482205120392 | 3k9 5% 0,1W | |
| 3722 | 482205120392 | 3k9 5% 0,1W | |
| 3723 | 482211683933 | 15k 1% 0,1W | Autoreverse |
| 3723 | 482211710965 | 18k 1% 0,1W | Non-autoreverse |
| 3724 | 482211683933 | 15k 1% 0,1W | Autoreverse |
| 3724 | 482211710965 | 18k 1% 0,1W | Non-autoreverse |
| 3725 | 482205120109 | 10R 5% 0,1W | |
| 3726 | 482205120109 | 10R 5% 0,1W | |
| 3727 | 482205120562 | 5k6 5% 0,1W | Autoreverse |
| 3727 | 482211711507 | 6k8 1% 0,1W | Non-autoreverse |
| 3728 | 482205120562 | 5k6 5% 0,1W | Autoreverse |
| 3728 | 482211711507 | 6k8 1% 0,1W | Non-autoreverse |
| 3729 | 482205120332 | 3k3 5% 0,1W | Autoreverse |
| 3729 | 482205120472 | 4k7 5% 0,1W | Non-autoreverse |
| 3730 | 482205120332 | 3k3 5% 0,1W | Autoreverse |
| 3730 | 482205120472 | 4k7 5% 0,1W | Non-autoreverse |
| 3731 | 482205120822 | 8k2 5% 0,1W | |
| 3732 | 482205120822 | 8k2 5% 0,1W | |
| 3733 | 482205120122 | 1k2 5% 0,1W | |
| 3734 | 482205120122 | 1k2 5% 0,1W | |
| 3735 | 482205120223 | 22k 5% 0,1W | |
| 3736 | 482205120223 | 22k 5% 0,1W | |
| 3741 | 482211711449 | 2k2 1% 0,1W | |
| 3742 | 482211711449 | 2k2 1% 0,1W | |
| 3743 | 482211711139 | 1k5 1% 0,1W | Autoreverse |
| 3743 | 482211711449 | 2k2 1% 0,1W | Non-autoreverse |
| 3744 | 482211711139 | 1k5 1% 0,1W | Autoreverse |
| 3744 | 482211711449 | 2k2 1% 0,1W | Non-autoreverse |
| 3745 | 482205120332 | 3k3 5% 0,1W | Autoreverse |
| 3745 | 482205120562 | 5k6 5% 0,1W | Non-autoreverse |
| 3746 | 482205120332 | 3k3 5% 0,1W | Autoreverse |
| 3746 | 482205120562 | 5k6 5% 0,1W | Non-autoreverse |
| 3748 | 482211711449 | 2k2 1% 0,1W | |
| 3749 | 482211710834 | 47k 1% 0,1W | |
| 3751 | 482211710833 | 10k 1% 0,1W | |
| 3752 | 482211710837 | 100k 1% 0,1W | |
| 3753 | 482211710837 | 100k 1% 0,1W | |
| 3754 | 482205120105 | 1M 5% 0,1W | Autoreverse |
| 3754 | 482205120479 | 47R 5% 0,1W | Non-autoreverse |
| 3755 | 482205120105 | 1M 5% 0,1W | Autoreverse |
| 3755 | 482205120479 | 47R 5% 0,1W | Non-autoreverse |
| 3756 | 482211713579 | 220k 1% 0,1W | |
| 3757 | 482211713579 | 220k 1% 0,1W | |
| 3758 | 482211710833 | 10k 1% 0,1W | |
| 3759 | 482211710833 | 10k 1% 0,1W | |
| 3760 | 482205120121 | 120R 5% 0,1W | |
| 3761 | 482205021003 | 10k 1% 0,6W | |
| 3762 | 482211711454 | 820R 1% 0,1W | |
| 3763 | 482205120154 | 150k 5% 0,1W | |
| 3764 | 482211683872 | 220R 5% 0,5W | |
| 3765 | 482205120393 | 39k 5% 0,1W | |
| 3766 | 482205120475 | 4M7 5% 0,1W | |
| 3767 | 482205120475 | 4M7 5% 0,1W | |
| 3768 | 482211710833 | 10k 1% 0,1W | |
| 3769 | 482211711383 | 12k 1% 0,1W | Autoreverse |
| 3769 | 482205120822 | 8k2 5% 0,1W | Non-autoreverse |
| 3770 | 482211711139 | 1k5 1% 0,1W | |
| 3771 | 482205120122 | 1k2 5% 0,1W | |
| 3772 | 482211711507 | 6k8 1% 0,1W | Autoreverse |
| 3772 | 482205120562 | 5k6 5% 0,1W | Non-autoreverse |
| 3773 | 482210012227 | Trimmer 4k7 30% 0,1W | |
| 3774 | 482211683933 | 15k 1% 0,1W | Autoreverse |
| 3774 | 482205120822 | 8k2 5% 0,1W | Non-autoreverse |
| 3775 | 482205120478 | 4R7 5% 0,1W | |
| 3776 | 482211711507 | 6k8 1% 0,1W | |
| 3777 | 482211710353 | 150R 1% 0,1W | |
| 3778 | 482205210688 | ⚠ 6R8 5% 0,33W | |
| 3779 | 482205120334 | 330k 5% 0,1W | |
| 3780 | 482205120105 | 1M 5% 0,1W | |
| 3781 | 482205120475 | 4M7 5% 0,1W | |
| 3784 | 482205110102 | 1k 2% 0,25W | |
| 3786 | 482205120223 | 22k 5% 0,1W | |
| 3787 | 482205120105 | 1M 5% 0,1W | |
| 3788 | 482205120105 | 1M 5% 0,1W | |
| 3789 | 482211710834 | 47k 1% 0,1W | |
| 4701 | 482205120008 | 0R Jumper 0805 | |
| 4702 | 482205120008 | 0R Jumper 0805 | |
| 4703 | 482205120008 | 0R Jumper 0805 | |
| 4704 | 482205120008 | 0R Jumper 0805 | |
| 4705 | 482205120008 | 0R Jumper 0805 | |
| 4706 | 482205120008 | 0R Jumper 0805 | |

9-14

***ELECTRICAL PARTS LIST - ETF7 NON-DOLBY BOARD***

RESISTORS

| | | | |
|---|---|---|---|
| 4707 | 482205120008 | 0R Jumper 0805 | |
| 4708 | 482205120008 | 0R Jumper 0805 | |
| 4709 | 482205120008 | 0R Jumper 0805 | |
| 4710 | 482205120008 | 0R Jumper 0805 | |
| 4711 | 482205120008 | 0R Jumper 0805 | |
| 4712 | 482205120008 | 0R Jumper 0805 | |
| 4713 | 482205120008 | 0R Jumper 0805 | |
| 4714 | 482205120008 | 0R Jumper 0805 | |
| 4715 | 482205120008 | 0R Jumper 0805 | |
| 4716 | 482205120008 | 0R Jumper 0805 | |
| 4717 | 482205120008 | 0R Jumper 0805 | |
| 4718 | 482205120008 | 0R Jumper 0805 | |
| 4719 | 482205120008 | 0R Jumper 0805 | |
| 4720 | 482205120008 | 0R Jumper 0805 | |
| 4721 | 482205120008 | 0R Jumper 0805 | |
| 4722 | 482205120008 | 0R Jumper 0805 | |
| 4723 | 482205120008 | 0R Jumper 0805 | |
| 4724 | 482205120008 | 0R Jumper 0805 | |
| 4725 | 482205120008 | 0R Jumper 0805 | |
| 4726 | 482205120008 | 0R Jumper 0805 | |
| 4727 | 482205120008 | 0R Jumper 0805 | |
| 4728 | 482205120008 | 0R Jumper 0805 | |
| 4729 | 482205120008 | 0R Jumper 0805 | |
| 4730 | 482205120008 | 0R Jumper 0805 | |
| 4731 | 482205120008 | 0R Jumper 0805 | |
| 4732 | 482205120008 | 0R Jumper 0805 | |
| 4733 | 482205120008 | 0R Jumper 0805 | |
| 4734 | 482205120008 | 0R Jumper 0805 | |
| 4735 | 482205120008 | 0R Jumper 0805 | |
| 4736 | 482205120008 | 0R Jumper 0805 | |
| 4737 | 482205120008 | 0R Jumper 0805 | |
| 4738 | 482205120008 | 0R Jumper 0805 | |
| 4739 | 482205120008 | 0R Jumper 0805 | |
| 4740 | 482205120008 | 0R Jumper 0805 | |
| 4741 | 482205120008 | 0R Jumper 0805 | |
| 4742 | 482205120008 | 0R Jumper 0805 | |
| 4744 | 482205120008 | 0R Jumper 0805 | |
| 4745 | 482205120008 | 0R Jumper 0805 | |
| 4746 | 482205120008 | 0R Jumper 0805 | |
| 4748 | 482205120008 | 0R Jumper 0805 | |
| 4785 | 482205120008 | 0R Jumper 0805 | |
| 4790 | 482205120008 | 0R Jumper 0805 | |
| 4794 | 482205120008 | 0R Jumper 0805 | |
| 4795 | 482205120008 | 0R Jumper 0805 | |

COILS & FILTERS

| | | |
|---|---|---|
| 5701 | 482215711477 | Coil 2,2µH 5% |
| 5703 | 482215620946 | Osc Coil 100kHz |

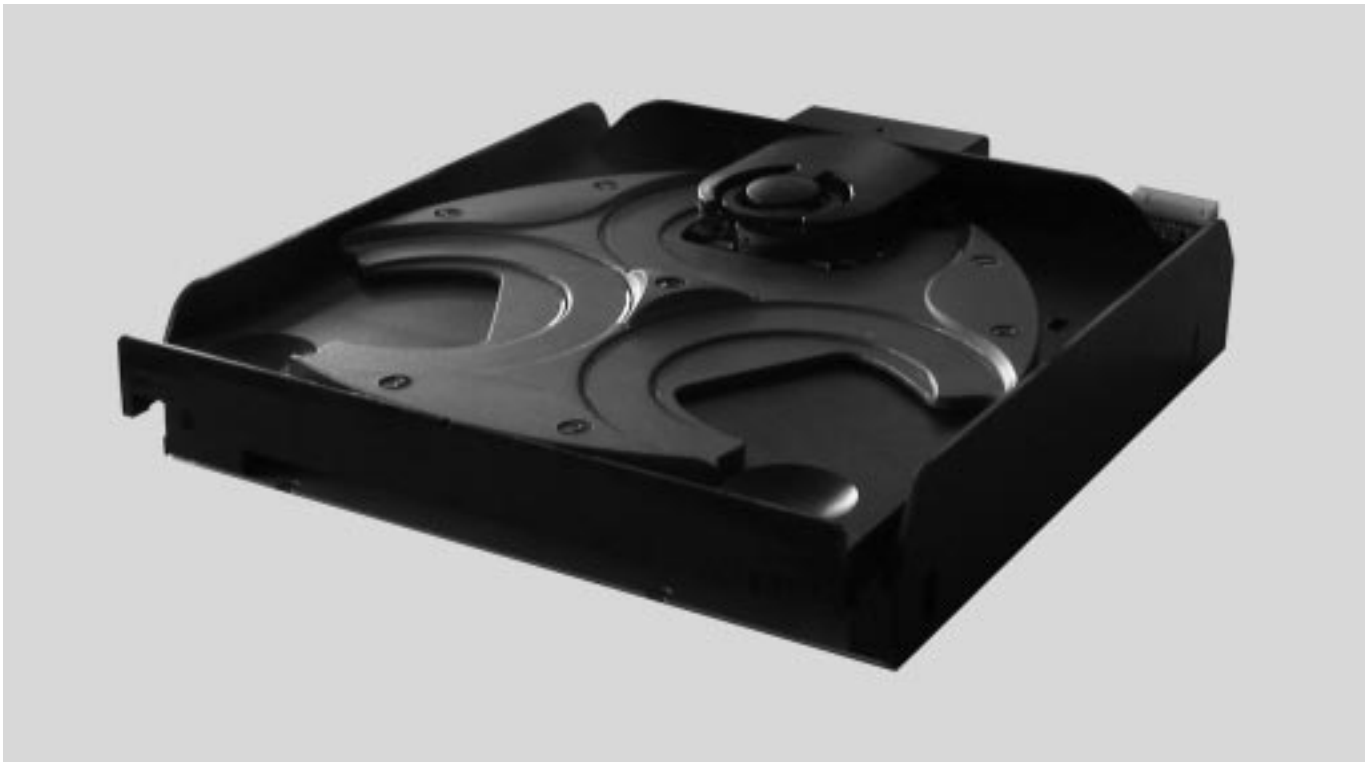
DIODES

| | | | |
|---|---|---|---|
| 6611 | 482213031878 | 1N4003G | |
| 6612 | 482213031878 | 1N4003G | |
| 6614 | 482213030621 | 1N4148 | Autoreverse |
| 6770 | 482213030621 | 1N4148 | |
| 6771 | 482213030621 | 1N4148 | |
| 6772 | 482213030621 | 1N4148 | |
| 6773 | 482213030621 | 1N4148 | |
| 6774 | 482213030621 | 1N4148 | |
| 6775 | 482213030621 | 1N4148 | |
| 6776 | 482213030621 | 1N4148 | |
| 6777 | 482213034382 | BZX79-F8V2 | |
| 6778 | 482213030621 | 1N4148 | |
| 6782 | 482213030621 | 1N4148 | |
| 6785 | 482213030621 | 1N4148 | |
| 6786 | 482213030621 | 1N4148 | |

TRANSISTORS & INTEGRATED CIRCUITS

| | | | |
|---|---|---|---|
| 7610 | 532220911306 | HEF4094BT | |
| 7612 | 532213060845 | BC807-25 | |
| 7613 | 532213060845 | BC807-25 | |
| 7614 | 532213060845 | BC807-25 | |
| 7616 | 482213060373 | BC857B | Autoreverse |
| 7618 | 482213060511 | BC847B | |
| 7619 | 482213060511 | BC847B | |
| 7620 | 482213060511 | BC847B | |
| 7622 | 482213060511 | BC847B | Autoreverse |
| 7623 | 482213060511 | BC847B | |
| 7624 | 482213060511 | BC847B | |
| 7710 | 482220932919 | HEF4952BT | |
| 7720 | 932214000668 | AN7323S | |
| 7730 | 482220932919 | HEF4952BT | |
| 7740 | 482220932919 | HEF4952BT | |
| 7780 | 482213060511 | BC847B | |
| 7781 | 482213042804 | BC817-25 | |
| 7782 | 482213044568 | BC557B | |
| 7783 | 482213060511 | BC847B | |
| 7784 | 482213060373 | BC857B | |
| 7786 | 482213063494 | J111 | |
| 7787 | 482213060511 | BC847B | |
| 7791 | 482213060511 | BC847B | |
| 7792 | 482213060511 | BC847B | |

Note: Only the parts mentioned in this list are normal service spare parts.



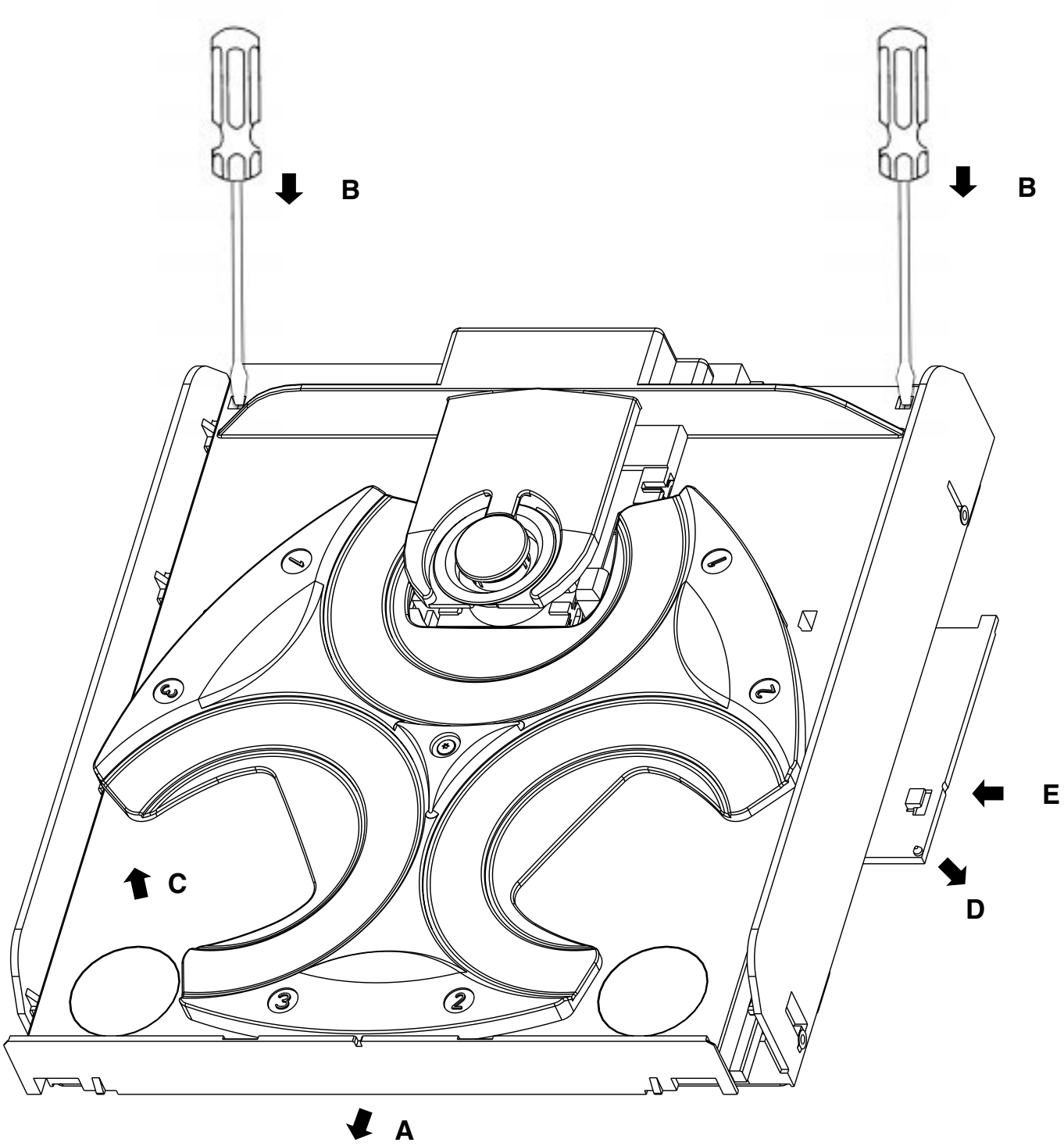
# 3CDC 99 Module

## (3 Disc Carrousel Changer)

**TABLE OF CONTENTS**


Demounting Hints .....10-2
Servicing Hints.....10-3
Lubrication Instructions.....10-4
ESD Warnings .....10-6
Blockdiagram.....10-7
Wiring .....10-8
Circuit Diagram part1.....10-9
Component Layout .....10-10
Circuit Diagram part2.....10-11
Exploded View.....10-12
Mechanical Partslist.....10-13
Electrical Partslist .....10-15

## Demounting Hints




### Demounting of Drawer

→ **A** Pull drawer outwards
→ **B** Unlock drawer with screwdriver
→ **C** Lift drawer to demount from chassis

### Demounting of Flex Plate

→ **D** Lift plate to unlock pin from bottom plate
→ **E** Move plate inwards to demount from bottom plate

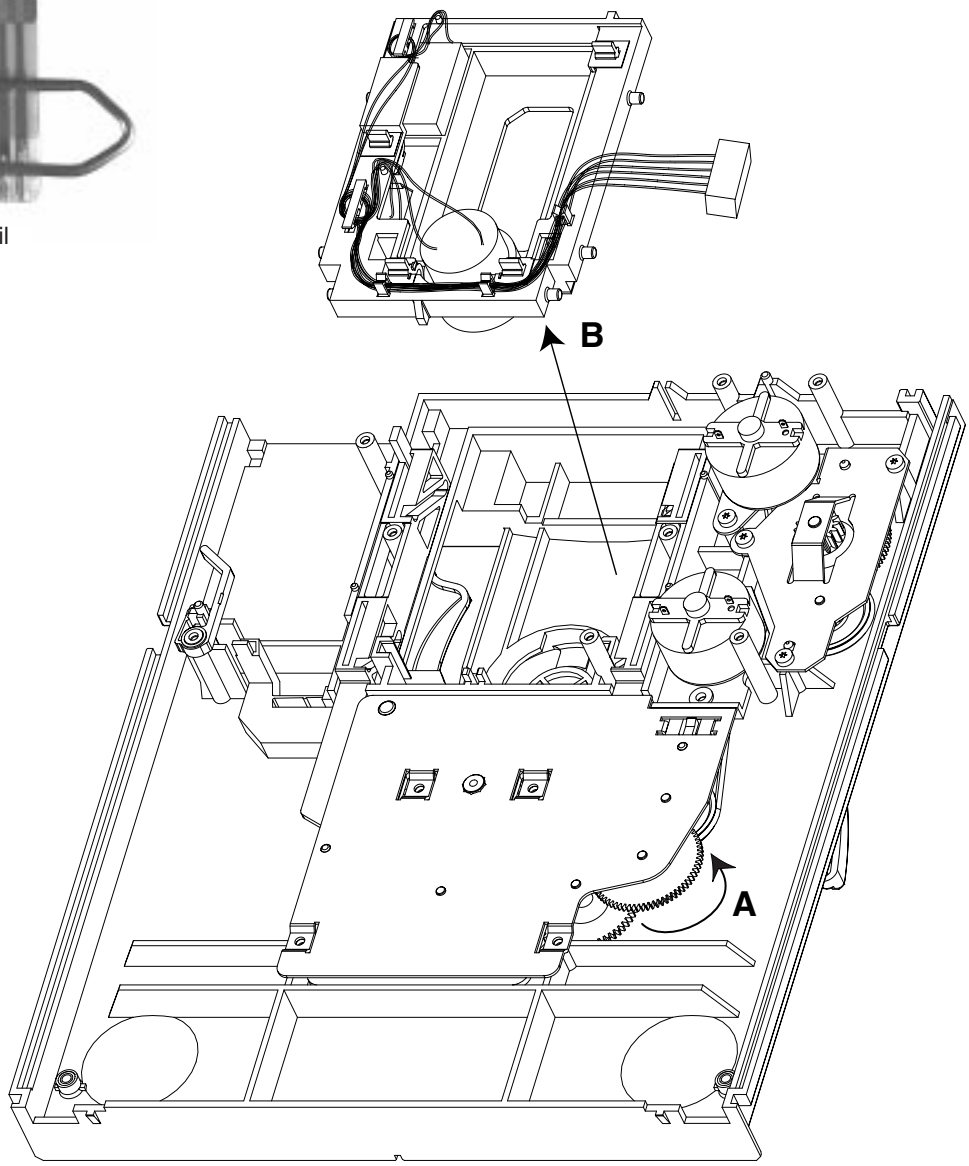
## Servicing Hints

**Replacement of CD Drive**

See also exploded view of changer mechanism.

1. Demount printed circuit board: remove 5 screws.
2. Disconnect flexfoil and JST connector of CD drive from Printed circuit board. Shortcircuit the flexfoil with a paperclip to protect the laser against ESD.
3. Remove 2 screws (pos 107,108) and demount CD drive lockings (pos 105,106).
4. Turn gearwheel (pos 42) of disc change mechanism by finger to move CD drive support in upper position as shown in picture below Ⓐ.
5. Demount CD drive support (pos 95) Ⓑ.
6. Replace CD drive (pos 100). The wire tree of JST connector has to be desoldered and resoldered on the new CD drive again.

CD drive flex foil

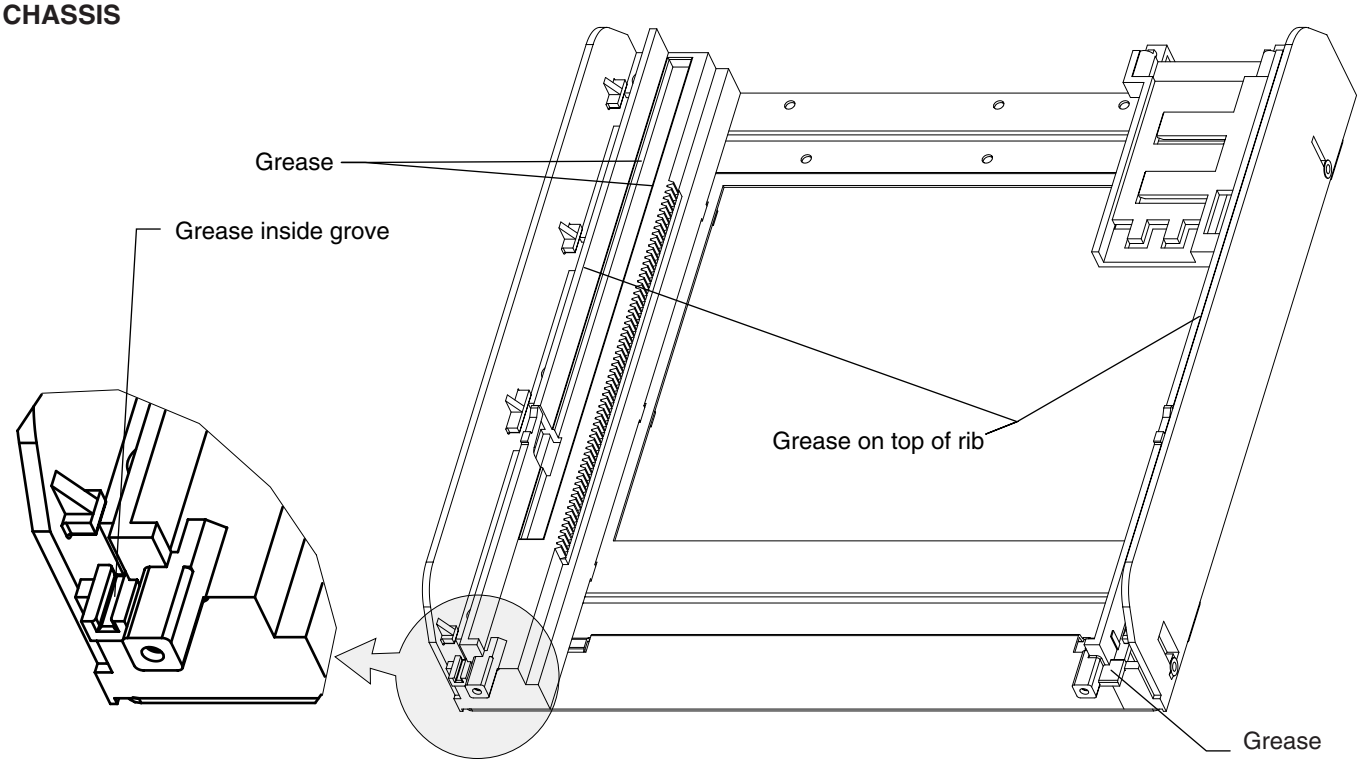



**Mounting of Carrousel**

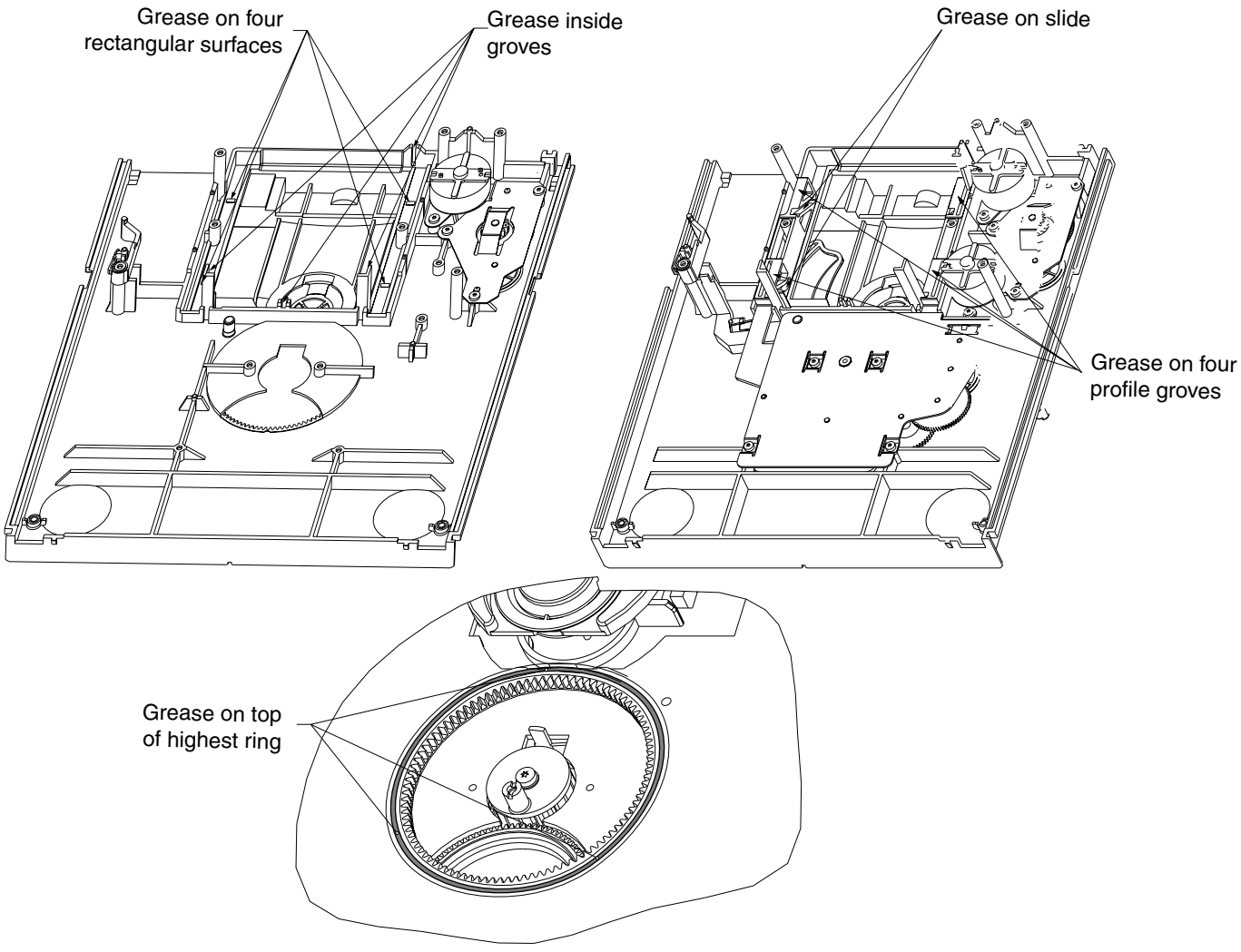
1. Turn gearwheel (pos 42) of disc change mechanism by finger until CD drive is in play position.
2. Mount carrousel (pos 115) so that disc is positioned right on turntable. Carrousel position number doesn´t matter.

# Lubrication Instructions

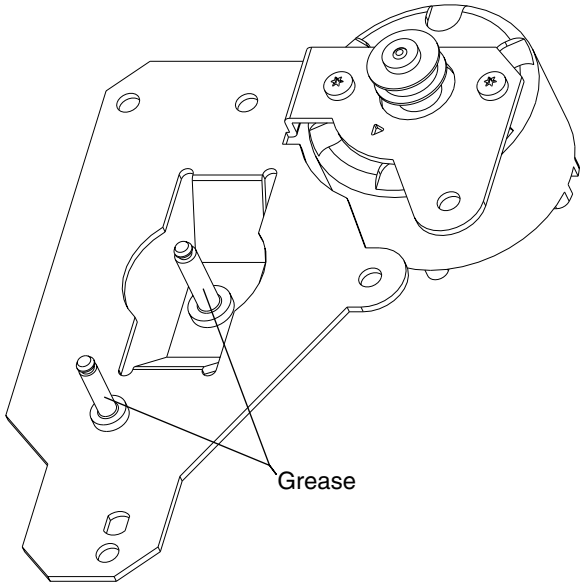
## CHASSIS



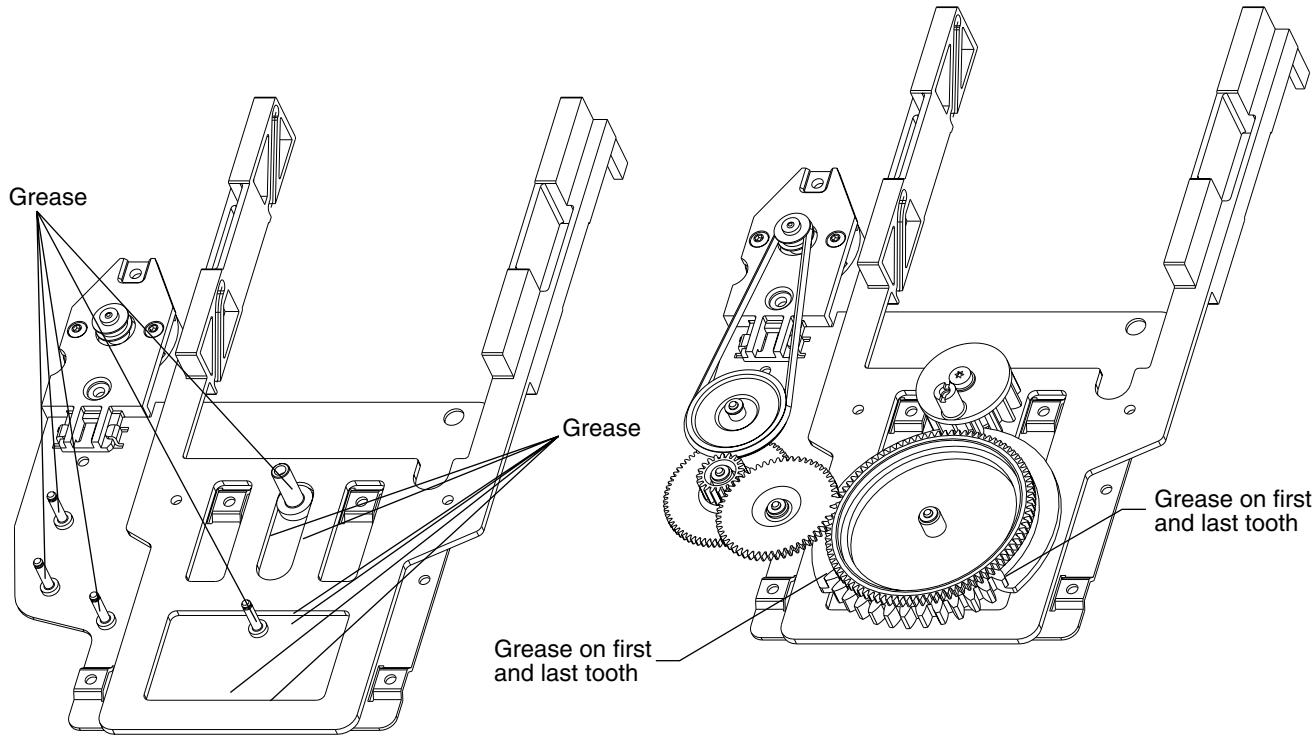

## DRAWER


Grease on four rectangular surfaces
Grease inside groves
Grease on slide
Grease on four profile groves
Grease on top of highest ring

**DRAWER MECHANISM**




**DISC CHANGE MECHANISM**




Use only grease **Polylub GLY 801** service codenumber 4822 390 10136

## WARNING

***CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CDM MECHANISM. THAT´S WHY, BESIDES THE SAFETY MEASURES LIKE***
***• SWITCH OFF POWER SUPPLY***
***• ESD PROTECTION***
***ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.***

The following steps have to be done when replacing the CD mechanism:

1. Disconnect CD drive flexfoil from old CD drive
2. Connect paperclip to CD drive flexfoil to short-circuit flexfoil (fig.1)
3. Remove old CD drive
4. Remove short-circuit from flexfoil
5. Connect flexfoil to new CD drive
6. Position new CD drive in its studs
7. Remove short-circuit from Laserunit

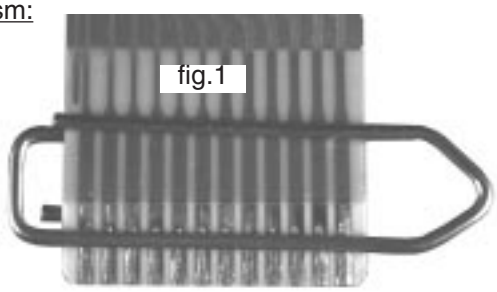
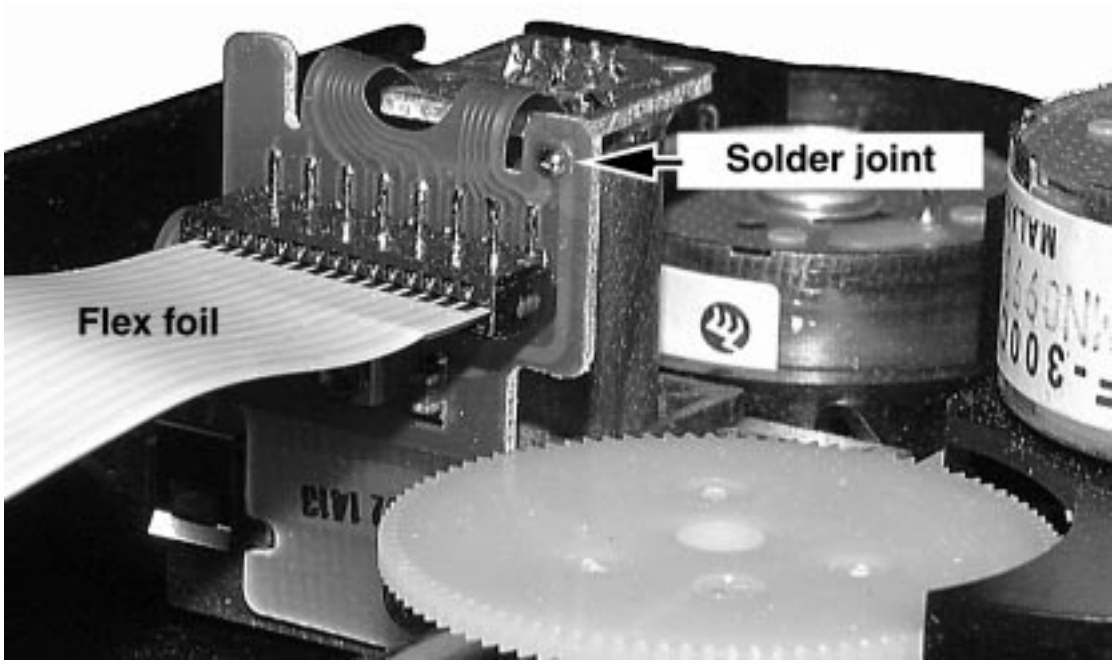
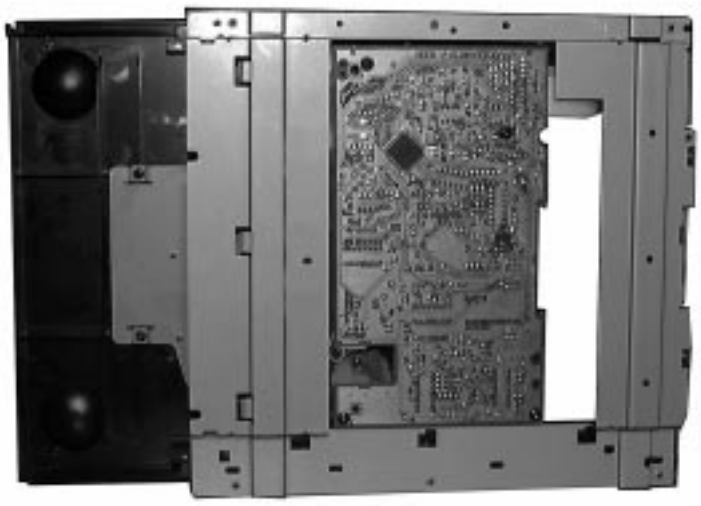


fig.1

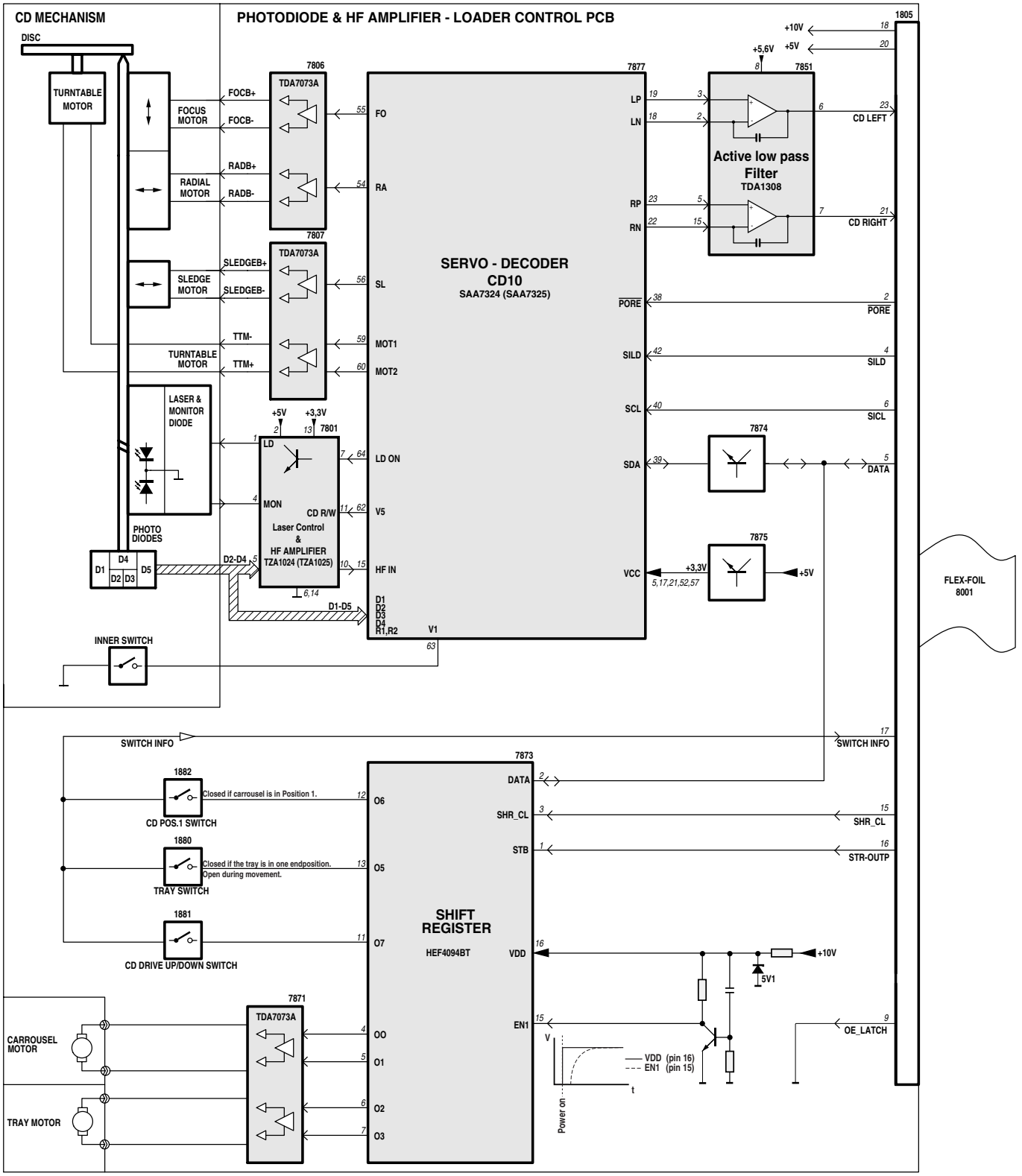
**Attention:** The laser diode of this CD drive is protected against ESD by a solder joint which shortcircuits the laser diode to ground.
For proper functionality of the CD drive this solder joint must be removed **after** connection the drive to the set.




## Service Position

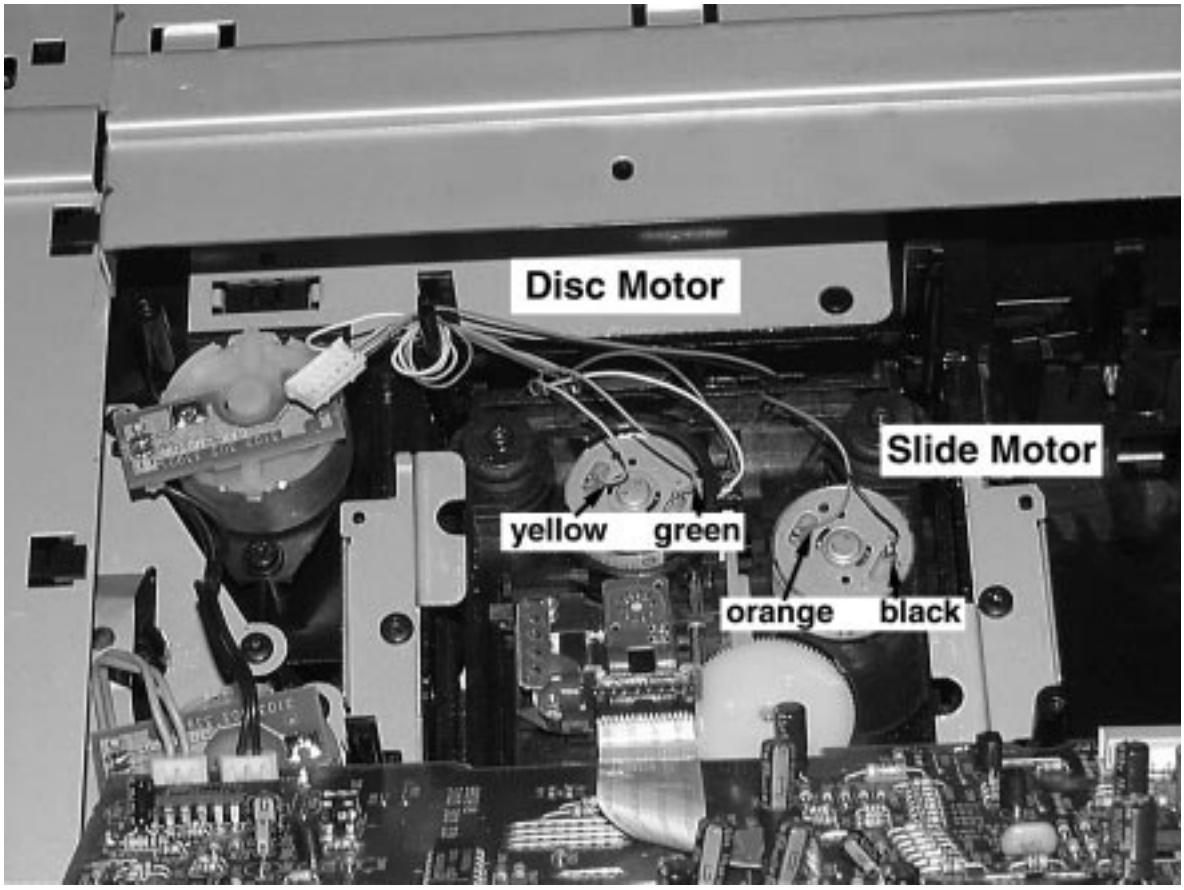


# Blockdiagram

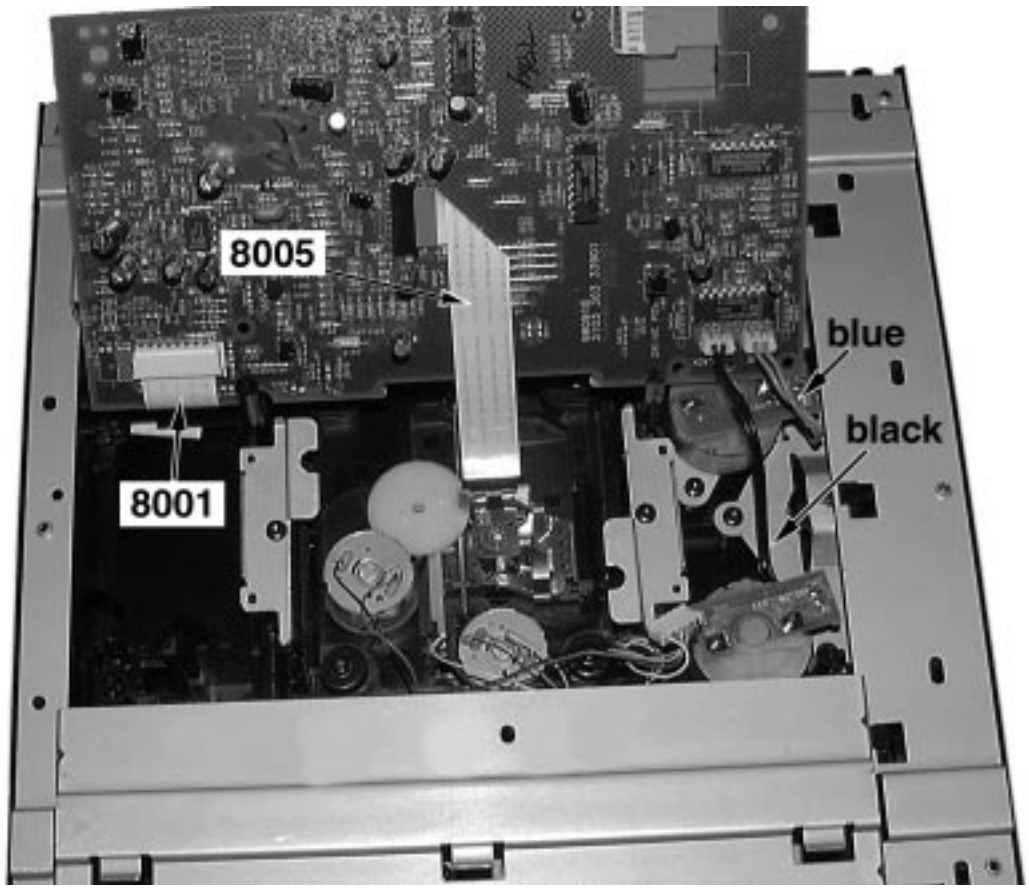



Blockdiagram 3CDC99 19981202

## Wiring of CD Drive



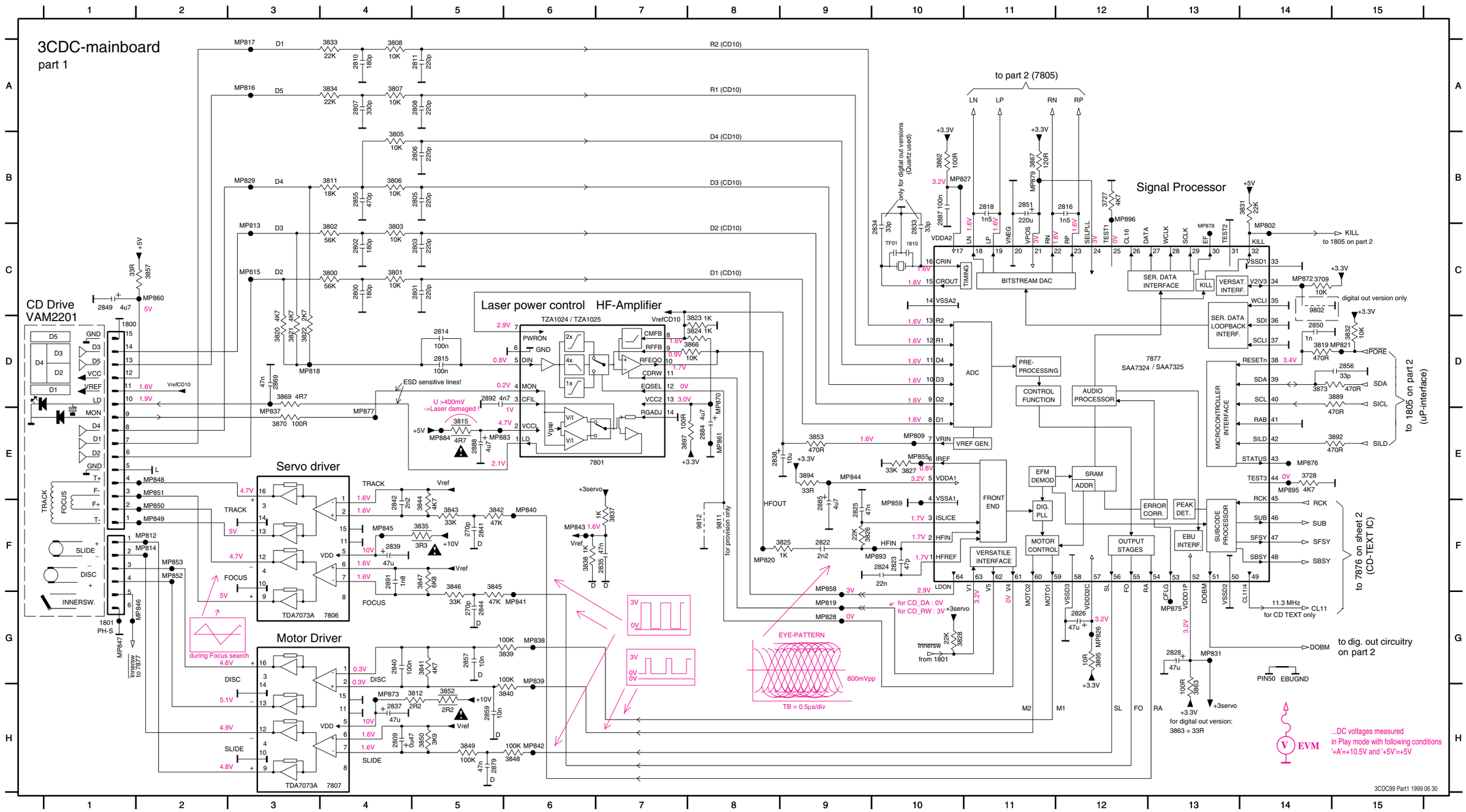

Pict. 1



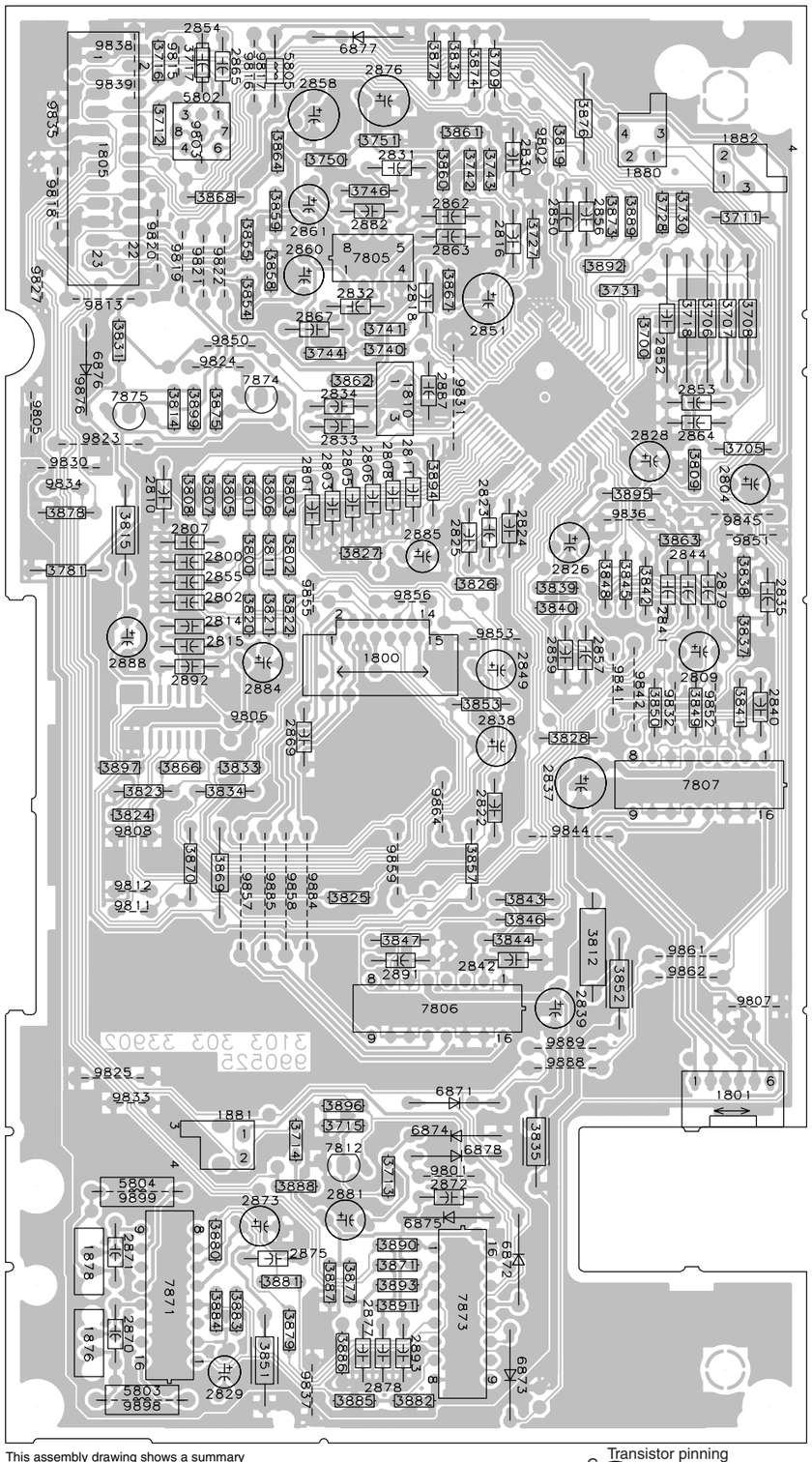

Pict. 2

10-9

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1800 D2 | 2805 B5 | 2814 D5 | 2825 F9 | 2838 E8 | 2850 D14 | 2879 H5 | 2892 D5 | 3803 C4 | 3815 E5 | 3825 F9 | 3834 A4 | 3842 F5 | 3849 H5 | 3866 D8 | 3894 E9 | 9802 C14 |
| 1801 G1 | 2806 B5 | 2815 D5 | 2826 G12 | 2839 F4 | 2851 B11 | 2880 D8 | 3709 C14 | 3805 B4 | 3819 D14 | 3826 F9 | 3835 F5 | 3843 F5 | 3850 H5 | 3867 B11 | 3895 G12 | 9811 F8 |
| 1810 C10 | 2807 A4 | 2816 B12 | 2828 G13 | 2840 G4 | 2855 B4 | 2884 E8 | 3727 B12 | 3806 B4 | 3820 D3 | 3827 E10 | 3837 F7 | 3844 F5 | 3852 H5 | 3869 D3 | 3897 E7 | 9812 F8 |
| 2800 C4 | 2808 A5 | 2818 B11 | 2833 C10 | 2841 F5 | 2856 D15 | 2885 F9 | 3728 E14 | 3807 A4 | 3821 D3 | 3828 G10 | 3838 F6 | 3845 F5 | 3853 E9 | 3870 E3 | 7801 E7 | |
| 2801 C5 | 2809 H4 | 2822 F9 | 2834 C10 | 2842 F4 | 2857 G5 | 2887 B10 | 3800 C4 | 3808 A4 | 3822 D3 | 3831 B14 | 3839 G6 | 3846 F5 | 3857 C2 | 3873 D14 | 7806 G4 | |
| 2802 C4 | 2810 A4 | 2823 F10 | 2835 F7 | 2844 G5 | 2859 H5 | 2888 E5 | 3801 C4 | 3811 B4 | 3823 D8 | 3832 D15 | 3840 H6 | 3847 F5 | 3862 B10 | 3889 D15 | 7807 H4 | |
| 2803 C5 | 2811 A5 | 2824 F10 | 2837 H4 | 2849 C1 | 2869 D3 | 2891 F4 | 3802 C4 | 3812 H5 | 3824 D8 | 3833 A4 | 3841 G5 | 3848 H6 | 3863 H13 | 3892 E15 | 7877 D12 | |



## 3CDC99 Board Componentside view



This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

Transistor pinning

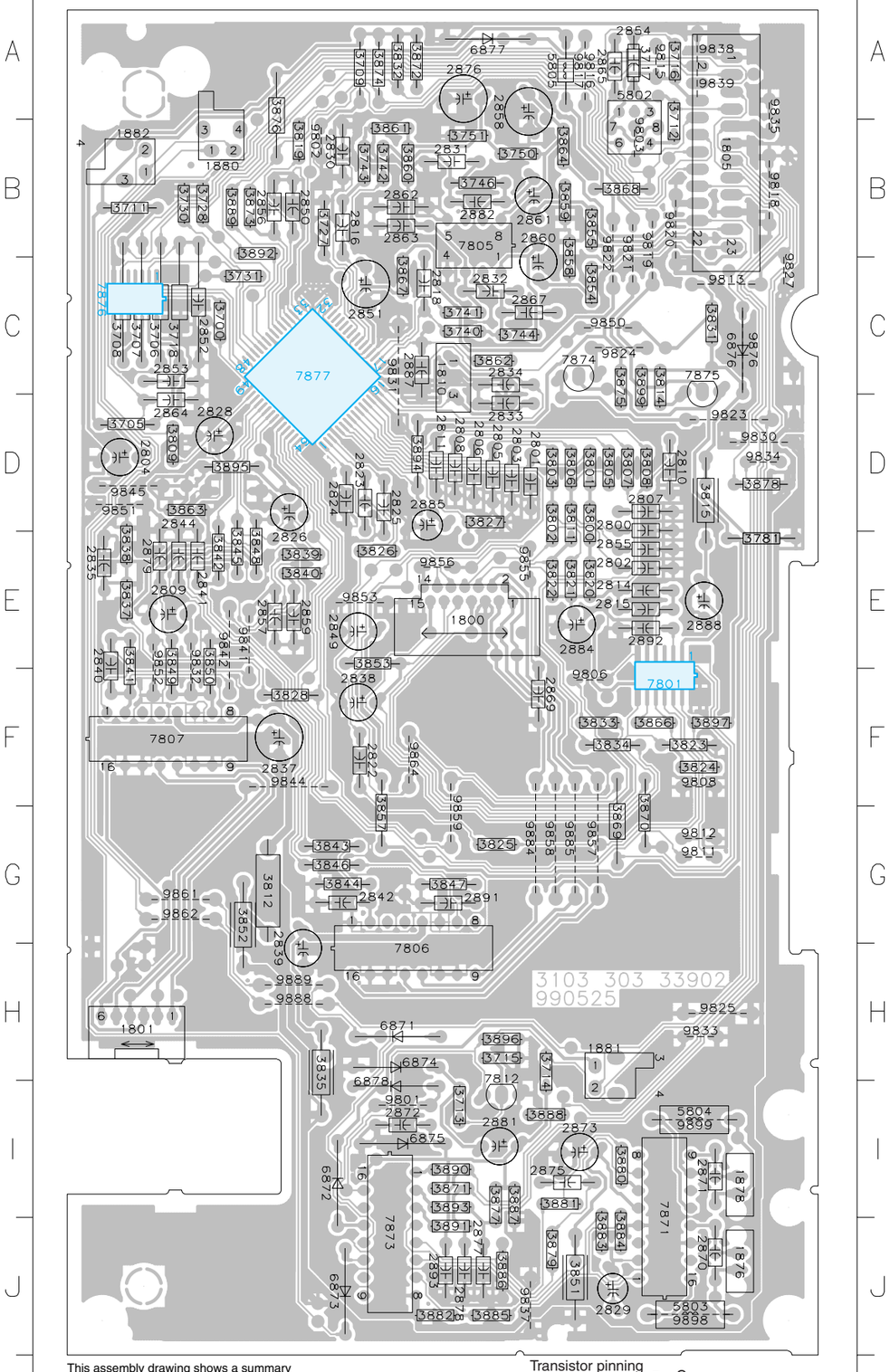
3CDC99 Layout stage .2 990701

## Mapping

| | | |
|---|---|---|
| 1800 E3 | 3716 A2 | 3888 I3 |
| 1801 H5 | 3717 A2 | 3889 B5 |
| 1805 B1 | 3718 C5 | 3890 I3 |
| 1810 C3 | 3727 B4 | 3891 J3 |
| 1876 J1 | 3728 B5 | 3892 B5 |
| 1878 I1 | 3730 B5 | 3893 I3 |
| 1880 B5 | 3731 C5 | 3894 D3 |
| 1881 H2 | 3740 C3 | 3895 D5 |
| 1882 B5 | 3741 C3 | 3896 H3 |
| 2800 D2 | 3742 B4 | 3897 F1 |
| 2801 D3 | 3743 B4 | 3899 C2 |
| 2802 E2 | 3744 C3 | 5802 A2 |
| 2803 D3 | 3746 B3 | 5803 J1 |
| 2804 D5 | 3750 B3 | 5804 I1 |
| 2805 D3 | 3751 B3 | 5805 A2 |
| 2806 D3 | 3781 E1 | 6871 H4 |
| 2807 D2 | 3800 D2 | 6872 I4 |
| 2808 D3 | 3801 D2 | 6873 J4 |
| 2809 E5 | 3802 D2 | 6874 H3 |
| 2810 D2 | 3803 D2 | 6875 I3 |
| 2811 D3 | 3805 D2 | 6876 C1 |
| 2814 E2 | 3806 D2 | 6877 A3 |
| 2815 E2 | 3807 D2 | 6878 H4 |
| 2816 B4 | 3808 D2 | 7801 F1 |
| 2818 C3 | 3809 D5 | 7805 B3 |
| 2822 F4 | 3811 D2 | 7806 H3 |
| 2823 D4 | 3812 G5 | 7807 F5 |
| 2824 D4 | 3814 C2 | 7812 H3 |
| 2825 D4 | 3815 D1 | 7871 J2 |
| 2826 E4 | 3819 B4 | 7873 J4 |
| 2828 D5 | 3820 E2 | 7874 C2 |
| 2829 J2 | 3821 E2 | 7875 C1 |
| 2830 B4 | 3822 E2 | 7876 C5 |
| 2831 B3 | 3823 F1 | 7877 C4 |
| 2832 C3 | 3824 F1 | 9801 I4 |
| 2833 D3 | 3825 G3 | 9802 B4 |
| 2834 C3 | 3826 E4 | 9803 B2 |
| 2835 E5 | 3827 D3 | 9805 D1 |
| 2837 F4 | 3828 F4 | 9806 F2 |
| 2838 F4 | 3831 C1 | 9807 G5 |
| 2839 H4 | 3832 A4 | 9808 F1 |
| 2840 E5 | 3833 F2 | 9811 G1 |
| 2841 E5 | 3834 F2 | 9812 G1 |
| 2842 G4 | 3835 H4 | 9813 C1 |
| 2844 D5 | 3837 E5 | 9815 A2 |
| 2849 E4 | 3838 E5 | 9816 A2 |
| 2850 B4 | 3839 E4 | 9817 A2 |
| 2851 C4 | 3840 E4 | 9818 B1 |
| 2852 C5 | 3841 E5 | 9819 B2 |
| 2853 C5 | 3842 E5 | 9820 B2 |
| 2854 A2 | 3843 G4 | 9821 B2 |
| 2855 E2 | 3844 G4 | 9822 B2 |
| 2856 B5 | 3845 E5 | 9823 D1 |
| 2857 E5 | 3846 G4 | 9824 C2 |
| 2858 A3 | 3847 G3 | 9825 H1 |
| 2859 E4 | 3848 E5 | 9827 C1 |
| 2860 B3 | 3849 E5 | 9830 D1 |
| 2861 B3 | 3850 E5 | 9831 C4 |
| 2862 B4 | 3851 J2 | 9832 E5 |
| 2863 B4 | 3852 G5 | 9833 H1 |
| 2864 D5 | 3853 E4 | 9834 D1 |
| 2865 A2 | 3854 C2 | 9835 A1 |
| 2867 C3 | 3855 B2 | 9836 D5 |
| 2869 F2 | 3857 G4 | 9837 J3 |
| 2870 J1 | 3858 C2 | 9838 A1 |
| 2871 I1 | 3859 B2 | 9839 A1 |
| 2872 I4 | 3860 B4 | 9841 E5 |
| 2873 I2 | 3861 B4 | 9842 E5 |
| 2875 I3 | 3862 C3 | 9844 F4 |
| 2876 A3 | 3863 D5 | 9845 D5 |
| 2877 J3 | 3864 B2 | 9850 C2 |
| 2878 J3 | 3866 F2 | 9851 D5 |
| 2879 E5 | 3867 C4 | 9852 E5 |
| 2881 I3 | 3868 B2 | 9853 E4 |
| 2882 B3 | 3869 G2 | 9855 E3 |
| 2884 E2 | 3870 G2 | 9856 E3 |
| 2885 D3 | 3871 I3 | 9857 G2 |
| 2887 C4 | 3872 A3 | 9858 G2 |
| 2888 E1 | 3873 B5 | 9859 G3 |
| 2891 G3 | 3874 A4 | 9861 G5 |
| 2892 E2 | 3875 C2 | 9862 G5 |
| 2893 J3 | 3876 A4 | 9864 F3 |
| 3700 C5 | 3877 I3 | 9876 C1 |
| 3705 D5 | 3878 D1 | 9884 G3 |
| 3706 C5 | 3879 J2 | 9885 G2 |
| 3707 C5 | 3880 I2 | 9888 H4 |
| 3708 C5 | 3881 I2 | 9889 H4 |
| 3709 A4 | 3882 J3 | 9898 J1 |
| 3711 B5 | 3883 J2 | 9899 I1 |
| 3712 B2 | 3884 J2 | |
| 3713 I3 | 3885 J3 | |
| 3714 H3 | 3886 J3 | |
| 3715 H3 | 3887 I3 | |

10-10

## 3CDC99 Board Copperside view



This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

Transistor pinning

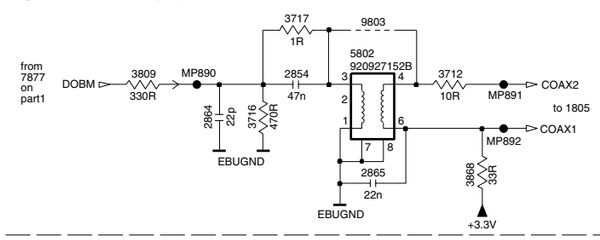
3CDC99 Layout stage .2 990701

10-11

1805 H14 1876 E3 1878 F3 1880 D8 1881 D8 1882 D8
2804 G4 2829 E6 2830 C10 2831 B9 2832 A8 2852 H2
2853 G4 2854 C3 2858 A10 2860 A11 2861 B11 2862 B8
2863 B8 2864 C2 2865 C3 2867 A9 2870 E3 2871 F4
2872 F10 2873 E6 2875 F6 2876 C8 2877 F11 2878 F11
2881 F8 2882 B10 2893 F12 3700 H2 3705 G4 3706 G4
3707 G4 3708 H4 3711 G4 3712 C4 3713 F8 3714 F8
3715 G8 3716 C3 3717 B3 3718 G3 3730 G2 3731 G2
3740 A7 3741 A7 3742 B7 3743 B7 3744 A9 3746 B10
3750 B7 3751 C7 3781 D12 3809 C2 3814 C12 3851 E6 3854 A11
3855 B11 3858 A11 3859 B11 3860 B8 3861 B8 3864 A7
3868 C4 3871 E11 3872 B13 3874 B13 3875 C12 3876 C12
3877 E11 3878 D7 3879 E7 3880 F6 3881 F7 3882 E7
3883 E6 3884 E6 3885 D6 3886 F7 3887 E12 3888 E12
3890 F11 3891 F11 3893 F11 3896 G10 3899 D12 5802 B3
5803 E4 5804 E4 5805 C11 6871 D8 6872 D8 6873 D8
6874 G7 6875 E12 6876 C13 6877 D12 6878 E8 7805-A A9
7805-B B10 7812 G8 7871 D5 7873 D9 7874 C12 7875 D12
7876 G3 9801 E8 9803 B3 9813 G14 9827 G14 9834 G10
9835 G11 9838 D14 9839 C14 9876 C13 9898 D4 9899 E4

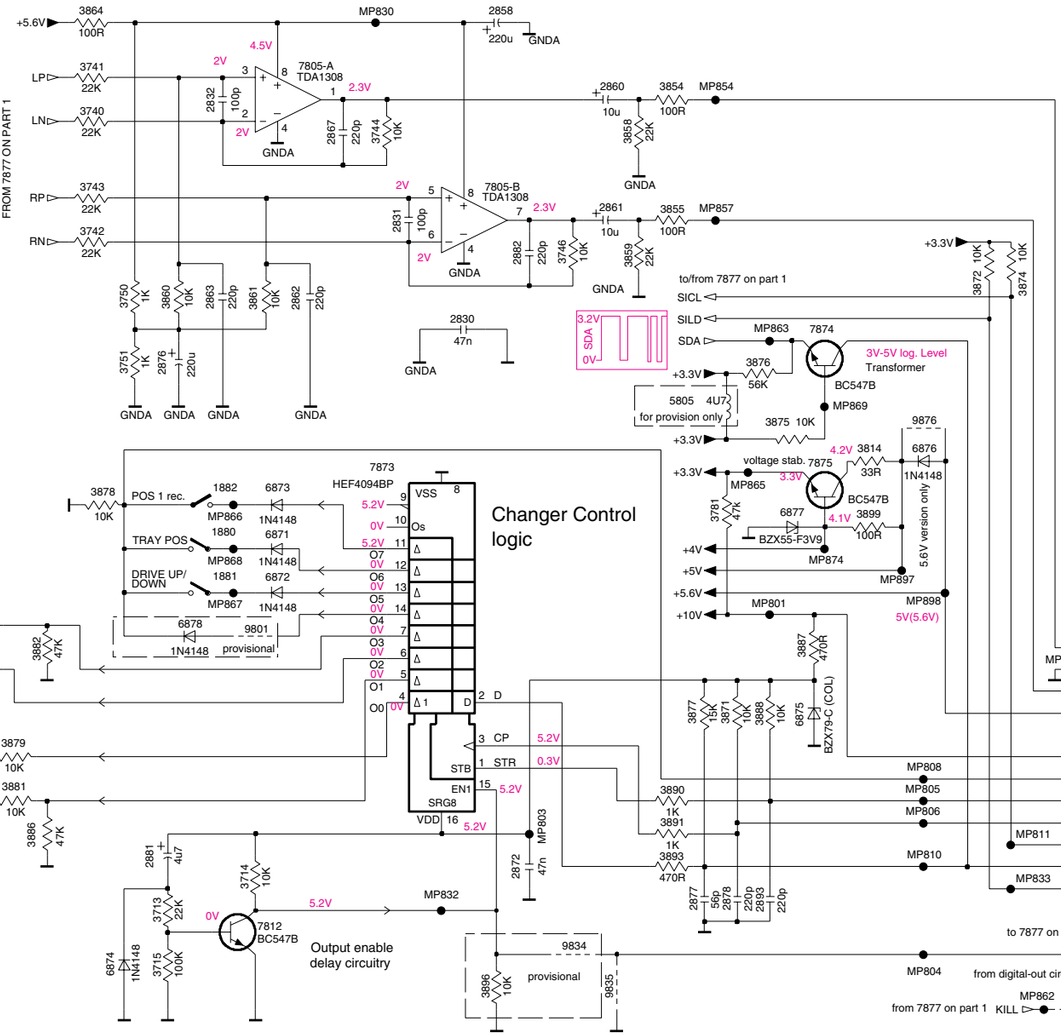
# 3CDC mainboard / part 2

## digital out circuitry (not for all versions)



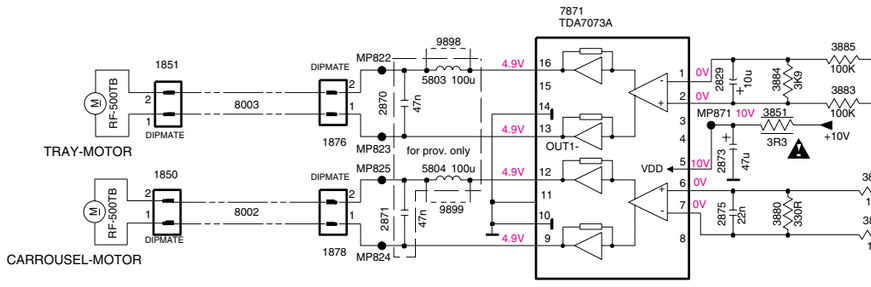

| ITEM | OPT_OUT | COAX_OUT |
|---|---|---|
| 3868 | YES | NO |
| 5802 | NO | YES |
| 9803 | YES | NO |
| 3809 | YES | YES |
| 3717 | YES | NO |
| 3716 | NO | YES |
| 3712 | 1R | 10R |
| 2865 | NO | YES |
| 2864 | YES | YES |
| 2854 | NO | YES |

FROM 7877 ON PART 1

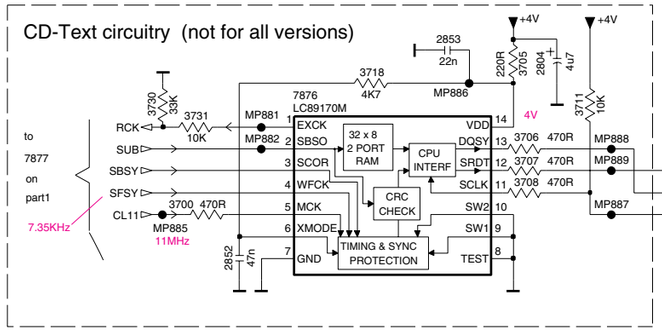



## Changer Control logic

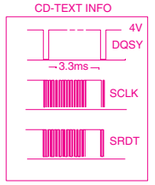



## CD-Text circuitry (not for all versions)




CD-TEXT INFO




only during TOC-reading

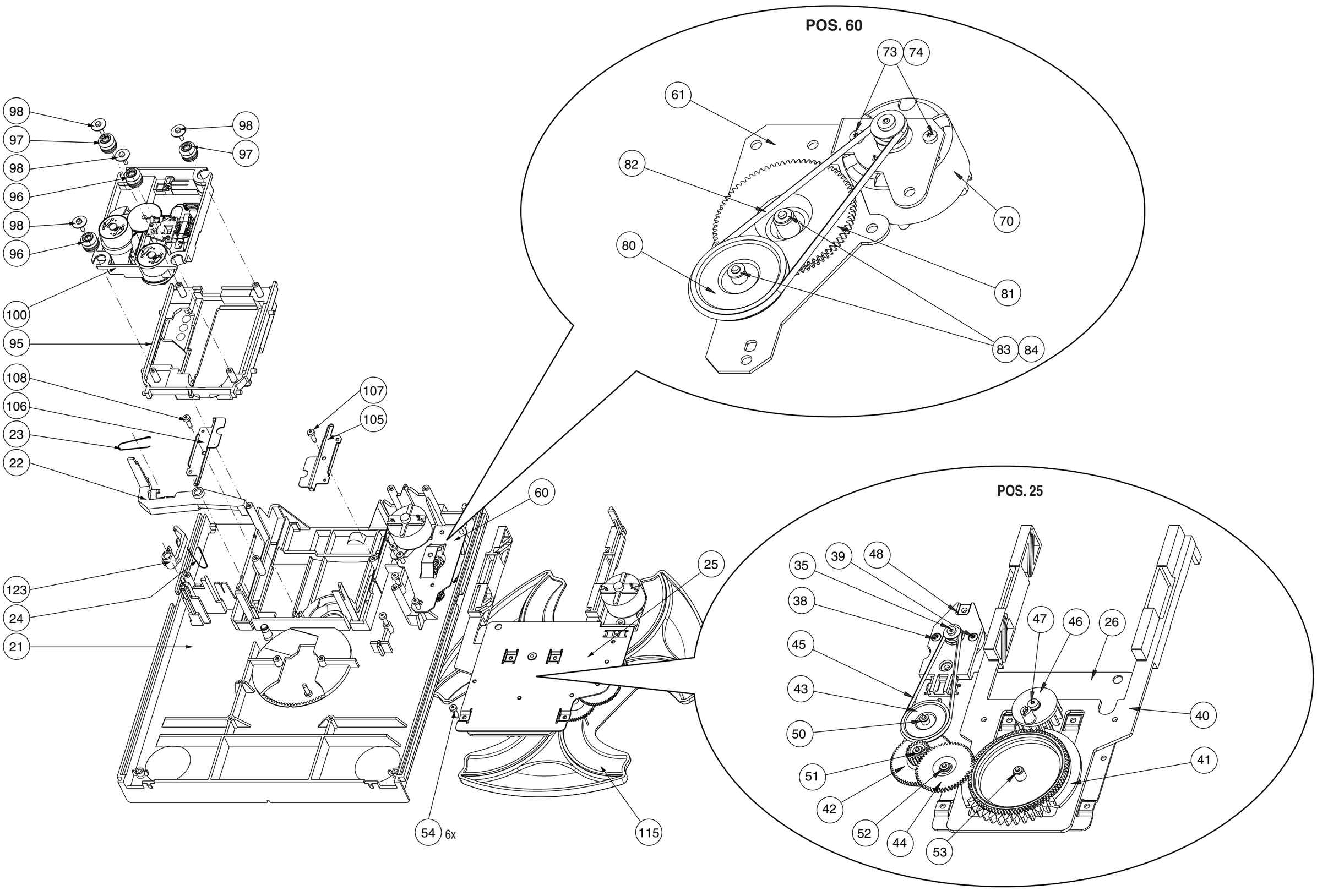
## Output enable delay circuitry




...DC voltages measured in Play mode with following conditions '+A'=+10.5V and '+5V'=+5V

3CDC99 Part2 1999 06 30

10-12


POS. 60
73
74
61
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70
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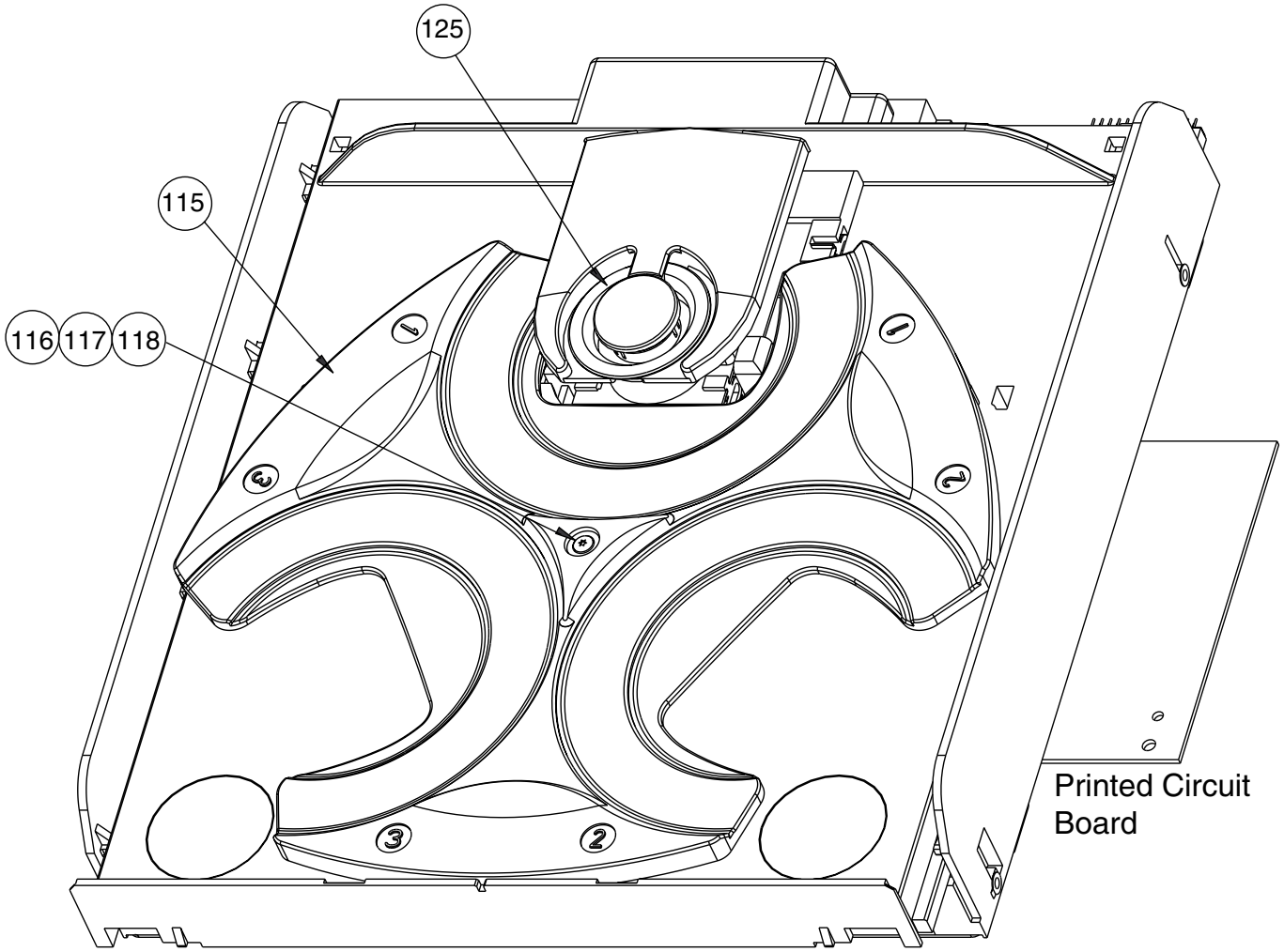
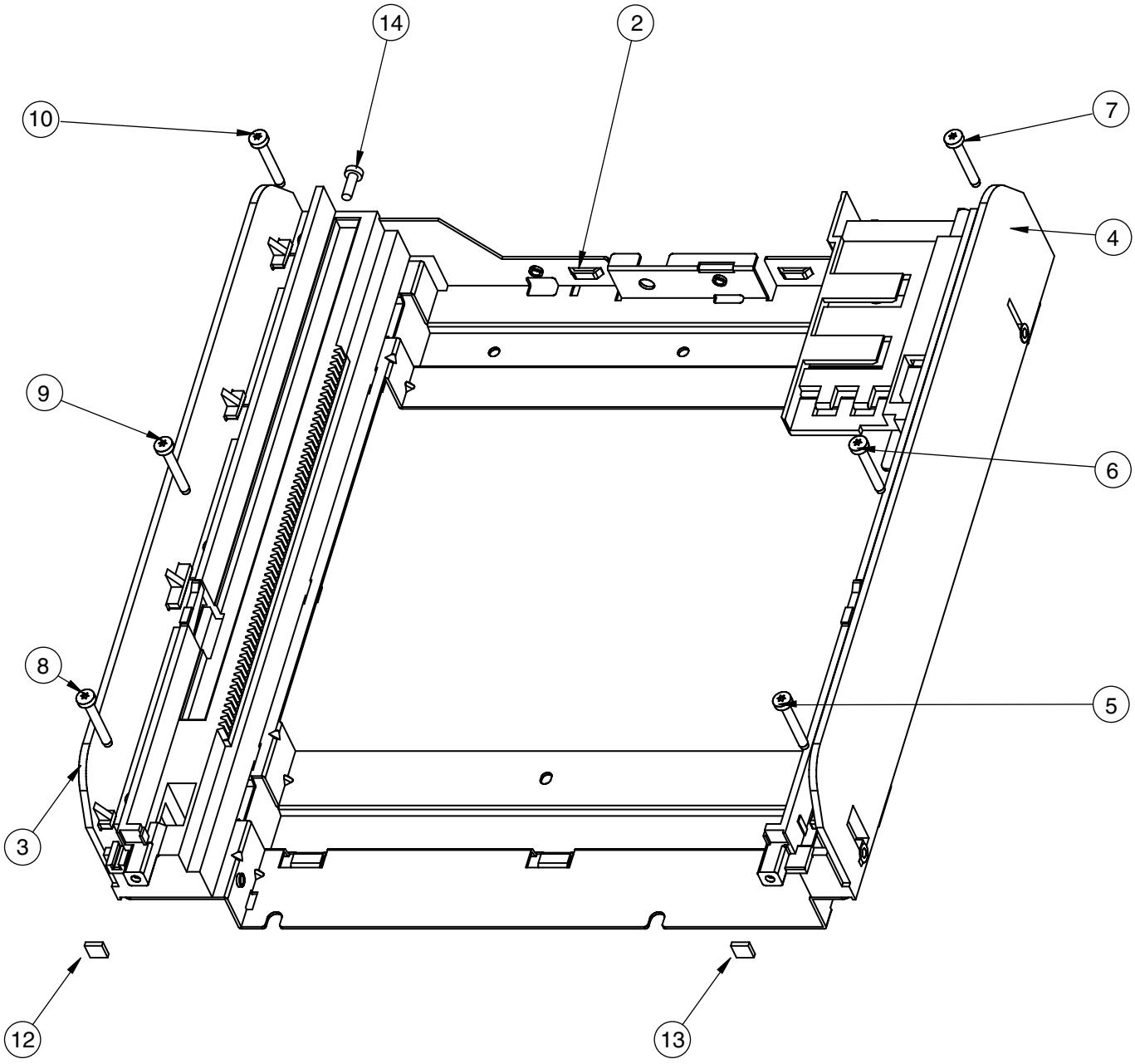
81
83
84
98
97
98
97
98
96
98
96
100
95
108
106
23
22
123
24
21
107
105
60
25
54
6x
115
POS. 25
35
39
48
38
47
46
26
45
43
40
50
41
51
42
52
44
53




***MECHANICAL PARTSLIST 3CDC-99 MODULE***

| | | |
|---|---|---|
| | 4822 390 10136 | POLYLUB GLY801 (GREASE) |
| 3 | 4822 463 11008 | GUIDE LEFT |
| 4 | 4822 463 11009 | GUIDE RIGHT |
| 21 | 4822 441 11615 | DRAWER |
| 22 | 4822 402 10088 | BRACKET TUMBLER |
| 38 | 4822 502 12548 | SCREW M2,6X3,5 |
| 39 | 4822 502 12548 | SCREW M2,6X3,5 |
| 40 | 4822 463 11011 | SLIDE |
| 41 | 4822 522 10509 | CONTROL DISC |
| 42 | 4822 522 10492 | GEAR WHEEL |
| 43 | 4822 528 10937 | PULLEY |
| 44 | 4822 522 10493 | IDLER WHEEL |
| 45 | 4822 358 10115 | BELT |
| 46 | 4822 466 10735 | ECCENTRIC GEAR WHEEL |
| 50 | 4822 532 12364 | WASHER |
| 51 | 4822 532 12364 | WASHER |
| 52 | 4822 532 12364 | WASHER |
| 53 | 4822 532 12364 | WASHER |
| 35 | 4822 361 10753 | CARROUSEL MOTOR |
| 70 | 4822 361 10753 | CARROUSEL MOTOR |

continued on next page




***MECHANICAL PARTSLIST 3CDC-99 MODULE***

| | | |
|---|---|---|
| 73 | 4822 502 12548 | SCREW M2,6X3,5 |
| 74 | 4822 502 12548 | SCREW M2,6X3,5 |
| 80 | 4822 528 10937 | PULLEY |
| 81 | 4822 522 10494 | GEAR DRAWER |
| 82 | 4822 358 10115 | BELT |
| 83 | 4822 532 12364 | WASHER |
| 84 | 4822 532 12364 | WASHER |
| 95 | 4822 404 10895 | SUPPORT |
| 96 | 4822 529 10431 | SUSPENSION |
| 97 | 4822 529 10431 | SUSPENSION |
| 100 | 4822 691 10772 | CD DRIVE VAM2201 |
| 115 | 4822 466 10736 | CARROUSEL |
| 117 | 4822 532 12365 | BUSH DRAWER |
| 123 | 4822 402 11237 | SWITCH BRACKET |
| 125 | 4822 401 11708 | DISC CLAMP |

***ELECTRICAL PARTSLIST 3CDC-99 MODULE***

MISCELLANEOUS

| | | |
|---|---|---|
| 1800 | 4822 265 10925 | FLEX FOIL CONNECTOR 15PIN |
| 1805 | 4822 265 11533 | FLEX FOIL CONNECTOR 23PIN |
| 1805 | 2422 025 09768 | FLEX FOIL CONNECTOR 19PIN |
| 1805 | 4822 267 51322 | FLEX FOIL CONNECTOR 15PIN |
| 1880 | 4822 276 13503 | SWITCH |
| 1881 | 4822 276 13503 | SWITCH |
| 1882 | 4822 276 13503 | SWITCH |
| 8001 | 4822 320 12659 | FLEX FOIL 23PIN 480MM * |
| 8001 | 4822 320 12729 | FLEX FOIL 23PIN 400MM |
| 8001 | 4822 320 12658 | FLEX FOIL 19PIN 480MM |
| 8001 | 4822 320 12232 | FLEX FOIL 15PIN 480MM |
| 8005 | 3103 308 91820 | FLEX FOIL 15PIN 95MM |

* will be replaced by shorter length (400mm) when stock is out.

CAPACITORS

| | | | | |
|---|---|---|---|---|
| 2800 | 4822 126 10053 | 180pF | 10% | 50V |
| 2801 | 4822 122 10466 | 220pF | 10% | 50V |
| 2802 | 4822 126 10053 | 180pF | 10% | 50V |
| 2803 | 4822 122 10466 | 220pF | 10% | 50V |
| 2804 | 4822 124 40246 | 4,7µF | 20% | 63V |
| 2805 | 4822 122 10466 | 220pF | 10% | 50V |
| 2806 | 4822 122 10466 | 220pF | 10% | 50V |
| 2807 | 4822 126 12787 | 330pF | 10% | 50V |
| 2808 | 4822 122 10466 | 220pF | 10% | 50V |
| 2809 | 5322 124 41948 | 0,47µF | 20% | 50V |
| 2810 | 4822 126 10053 | 180pF | 10% | 50V |
| 2811 | 4822 122 10466 | 220pF | 10% | 50V |
| 2814 | 4822 126 12882 | 100nF | 20% | 50V |
| 2815 | 4822 126 12882 | 100nF | 20% | 50V |
| 2816 | 4822 126 12878 | 1,5nF | 10% | 16V |
| 2818 | 4822 126 12878 | 1,5nF | 10% | 16V |
| 2822 | 4822 126 12339 | 2,2nF | 10% | 16V |
| 2823 | 4822 122 33848 | 47pF | 5% | 50V |
| 2824 | 4822 126 11585 | 22nF | 20% | 50V |
| 2825 | 4822 126 12785 | 47nF | 20% | 50V |
| 2826 | 4822 124 80231 | 47µF | 20% | 16V |
| 2828 | 4822 124 40433 | 47µF | 20% | 25V |
| 2829 | 4822 124 21732 | 10µF | 20% | 25V |
| 2830 | 4822 126 12785 | 47nF | 20% | 50V |
| 2831 | 4822 122 33195 | 100pF | 10% | 50V |
| 2832 | 4822 122 33195 | 100pF | 10% | 50V |
| 2833 | 4822 122 33069 | 33pF | 5% | 50V |
| 2834 | 4822 122 33069 | 33pF | 5% | 50V |
| 2835 | 4822 126 12785 | 47nF | 20% | 50V |
| 2837 | 4822 124 40433 | 47µF | 20% | 25V |
| 2838 | 4822 124 41579 | 10µF | 20% | 50V |
| 2839 | 4822 124 40433 | 47µF | 20% | 25V |
| 2840 | 4822 126 12882 | 100nF | 20% | 50V |
| 2841 | 4822 126 12702 | 270pF | 10% | 50V |
| 2842 | 4822 126 12339 | 2,2nF | 10% | 16V |
| 2844 | 4822 126 12702 | 270pF | 10% | 50V |
| 2849 | 4822 124 40246 | 4,7µF | 20% | 63V |
| 2850 | 4822 122 33197 | 1nF | 10% | 50V |
| 2851 | 4822 124 40196 | 220µF | 20% | 16V |
| 2852 | 4822 126 12785 | 47nF | 20% | 50V |
| 2853 | 4822 126 11585 | 22nF | 20% | 50V |
| 2854 | 4822 126 12785 | 47nF | 20% | 50V |
| 2855 | 4822 122 33519 | 470pF | 10% | 50V |
| 2856 | 4822 122 33069 | 33pF | 5% | 50V |
| 2857 | 4822 121 51387 | 10nF | 20% | 16V |
| 2858 | 4822 124 40196 | 220µF | 20% | 16V |
| 2859 | 4822 121 51387 | 10nF | 20% | 16V |
| 2860 | 4822 124 41579 | 10µF | 20% | 50V |
| 2861 | 4822 124 41579 | 10µF | 20% | 50V |

CAPACITORS

| | | | | |
|---|---|---|---|---|
| 2862 | 4822 122 10466 | 220pF | 10% | 50V |
| 2863 | 4822 122 10466 | 220pF | 10% | 50V |
| 2864 | 4822 122 33191 | 22pF | 5% | 50V |
| 2865 | 4822 126 11585 | 22nF | 20% | 50V |
| 2867 | 4822 122 10466 | 220pF | 10% | 50V |
| 2869 | 4822 126 12785 | 47nF | 20% | 50V |
| 2872 | 4822 126 12785 | 47nF | 20% | 50V |
| 2873 | 4822 124 12233 | 47µF | 20% | 25V |
| 2875 | 4822 126 11585 | 22nF | 20% | 50V |
| 2876 | 4822 124 40196 | 220µF | 20% | 16V |
| 2877 | 4822 122 10573 | 56pF | 5% | 50V |
| 2878 | 4822 122 10466 | 220pF | 10% | 50V |
| 2879 | 4822 126 12785 | 47nF | 20% | 50V |
| 2881 | 4822 124 40769 | 4,7µF | 20% | 50V |
| 2882 | 4822 122 10466 | 220pF | 10% | 50V |
| 2884 | 4822 124 40246 | 4,7µF | 20% | 63V |
| 2885 | 4822 124 40246 | 4,7µF | 20% | 63V |
| 2887 | 4822 126 12882 | 100nF | 20% | 50V |
| 2888 | 4822 124 40246 | 4,7µF | 20% | 63V |
| 2891 | 4822 122 10576 | 1,8nF | 10% | 16V |
| 2892 | 4822 126 11714 | 4,7nF | 20% | 16V |
| 2893 | 4822 122 10466 | 220pF | 10% | 50V |

RESISTORS

| | | | | |
|---|---|---|---|---|
| 3700 | 4822 116 83883 | 470Ω | 5% | 0,16W |
| 3705 | 4822 116 83872 | 220Ω | 5% | 0,5W |
| 3706 | 4822 116 83883 | 470Ω | 5% | 0,16W |
| 3707 | 4822 116 83883 | 470Ω | 5% | 0,16W |
| 3708 | 4822 116 83883 | 470Ω | 5% | 0,16W |
| 3709 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3711 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3712 | 4822 116 52176 | 10Ω | 5% | 0,5W |
| 3713 | 4822 116 52257 | 22kΩ | 5% | 0,5W |
| 3714 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3715 | 4822 116 52234 | 100kΩ | 5% | 0,5W |
| 3716 | 4822 116 83883 | 470Ω | 5% | 0,16W |
| 3718 | 4822 116 52283 | 4,7kΩ | 5% | 0,5W |
| 3727 | 4822 116 52283 | 4,7kΩ | 5% | 0,5W |
| 3728 | 4822 116 52283 | 4,7kΩ | 5% | 0,5W |
| 3730 | 4822 116 52271 | 33kΩ | 5% | 0,16W |
| 3731 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3740 | 4822 116 52257 | 22kΩ | 5% | 0,5W |
| 3741 | 4822 116 52257 | 22kΩ | 5% | 0,5W |
| 3742 | 4822 116 52257 | 22kΩ | 5% | 0,5W |
| 3743 | 4822 116 52257 | 22kΩ | 5% | 0,5W |
| 3744 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3746 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3750 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3751 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3781 | 4822 116 83884 | 47kΩ | 5% | 0,16W |
| 3800 | 4822 116 52291 | 56kΩ | 5% | 0,5W |
| 3801 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3802 | 4822 116 52291 | 56kΩ | 5% | 0,5W |
| 3803 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3805 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3806 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3807 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3808 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3809 | 4822 116 52219 | 330Ω | 5% | 0.16W |
| 3811 | 4822 116 52251 | 18kΩ | 5% | 0,5W |
| 3812 | 4822 053 10228 | 2,2Ω | 5% | 1W |
| 3814 | 4822 116 52191 | 33Ω | 5% | 0,5W |
| 3815 | 4822 052 10478 | 4,7Ω | 5% | NFR |
| 3819 | 4822 116 83883 | 470Ω | 5% | 0,16W |

***ELECTRICAL PARTSLIST 3CDC-99 MODULE***

RESISTORS

| | | | | |
|---|---|---|---|---|
| 3820 | 4822 116 52283 | 4,7kΩ | 5% | 0,5W |
| 3821 | 4822 116 52283 | 4,7kΩ | 5% | 0,5W |
| 3822 | 4822 116 52263 | 2,7kΩ | 5% | 0,16W |
| 3823 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3824 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3825 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3826 | 4822 116 52257 | 22kΩ | 5% | 0,5W |
| 3827 | 4822 116 52271 | 33kΩ | 5% | 0,16W |
| 3828 | 4822 116 52257 | 22kΩ | 5% | 0,5W |
| 3831 | 4822 116 52257 | 22kΩ | 5% | 0,5W |
| 3832 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3833 | 4822 116 52257 | 22kΩ | 5% | 0,5W |
| 3834 | 4822 116 52257 | 22kΩ | 5% | 0,5W |
| 3835 | 4822 052 10338 | 3,3Ω | | NFR25 |
| 3837 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3838 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3839 | 4822 116 52234 | 100kΩ | 5% | 0,5W |
| 3840 | 4822 116 52234 | 100kΩ | 5% | 0,5W |
| 3841 | 4822 116 52283 | 4,7kΩ | 5% | 0,5W |
| 3842 | 4822 116 83884 | 47kΩ | 5% | 0,16W |
| 3843 | 4822 116 52271 | 33kΩ | 5% | 0,16W |
| 3844 | 4822 116 52283 | 4,7kΩ | 5% | 0,5W |
| 3845 | 4822 116 83884 | 47kΩ | 5% | 0,16W |
| 3846 | 4822 116 52271 | 33kΩ | 5% | 0,16W |
| 3847 | 4822 116 83961 | 6,8kΩ | 5% | 0,16W |
| 3848 | 4822 116 52234 | 100kΩ | 5% | 0,5W |
| 3849 | 4822 116 52234 | 100kΩ | 5% | 0,5W |
| 3850 | 4822 116 52276 | 3,9kΩ | 5% | 0,5W |
| 3851 | 4822 052 10338 | 3,3Ω | | NFR25 |
| 3852 | 4822 052 10228 | 2,2Ω | 5% | 0,33W |
| 3853 | 4822 116 83883 | 470Ω | 5% | 0,16W |
| 3854 | 4822 116 52175 | 100Ω | 5% | 0,5W |
| 3855 | 4822 116 52175 | 100Ω | 5% | 0,5W |
| 3857 | 4822 116 52191 | 33Ω | 5% | 0,5W |
| 3858 | 4822 116 52257 | 22kΩ | 5% | 0,5W |
| 3859 | 4822 116 52257 | 22kΩ | 5% | 0,5W |
| 3860 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3861 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3862 | 4822 116 52175 | 100Ω | 5% | 0,5W |
| 3863 | 4822 116 52175 | 100Ω | 5% | 0,5W |
| 3863 | 4822 116 52191 | 33Ω | 5% | 0,5W |
| 3864 | 4822 116 52175 | 100Ω | 5% | 0,5W |
| 3866 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3867 | 4822 116 52206 | 120Ω | 5% | 0,16W |
| 3869 | 4822 050 24708 | 4,7Ω | 1% | 0,6W |
| 3870 | 4822 116 52175 | 100Ω | 5% | 0,5W |
| 3871 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3872 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3873 | 4822 116 83883 | 470Ω | 5% | 0,16W |
| 3874 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3875 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3876 | 4822 116 52291 | 56kΩ | 5% | 0,16W |
| 3877 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3878 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3879 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3880 | 4822 116 52219 | 330Ω | 5% | 0,5W |
| 3881 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3882 | 4822 116 83884 | 47kΩ | 5% | 0,16W |
| 3883 | 4822 116 52234 | 100kΩ | 5% | 0,5W |
| 3884 | 4822 116 52276 | 3,9kΩ | 5% | 0,5W |
| 3885 | 4822 116 52234 | 100kΩ | 5% | 0,5W |
| 3886 | 4822 116 83884 | 47kΩ | 5% | 0,16W |
| 3887 | 4822 116 83883 | 470Ω | 5% | 0,16W |
| 3888 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3889 | 4822 116 83883 | 470Ω | 5% | 0,16W |

RESISTORS

| | | | | |
|---|---|---|---|---|
| 3890 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3891 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3892 | 4822 116 83883 | 470Ω | 5% | 0,16W |
| 3893 | 4822 116 83883 | 470Ω | 5% | 0,16W |
| 3894 | 4822 116 52191 | 33Ω | 5% | 0,5W |
| 3895 | 4822 116 52176 | 10Ω | 5% | 0,5W |
| 3897 | 4822 116 52175 | 100Ω | 5% | 0,5W |
| 3899 | 4822 116 52175 | 100Ω | 5% | 0,5W |

COILS

| | | |
|---|---|---|
| 1810 | 4822 242 10849 | QUARTZ 8,46MHz |
| 1810 | 4822 242 73557 | CERAMIC RES. 8,46MHz |
| 5802 | 4822 156 31058 | FILTER DIGITAL OUT |

DIODES

| | | |
|---|---|---|
| 6871 | 4822 130 30621 | 1N4148 |
| 6872 | 4822 130 30621 | 1N4148 |
| 6873 | 4822 130 30621 | 1N4148 |
| 6874 | 4822 130 30621 | 1N4148 |
| 6875 | 4822 130 34233 | BZX79-B5V1 |
| 6877 | 4822 130 31981 | BZX79-C3V9 |

TRANSISTORS

| | | |
|---|---|---|
| 7812 | 4822 130 40959 | BC547B |
| 7874 | 4822 130 40959 | BC547B |
| 7875 | 4822 130 40959 | BC547B |

INTEGRATED CIRCUITS

| | | |
|---|---|---|
| 7801 © | 4822 209 17286 | TZA1024T/N1 HF-AMPLIFIER |
| 7805 | 4822 209 17284 | TDA1308 OPAMP |
| 7806 | 4822 209 32852 | TDA7073A/N2 SERVO DRIVER |
| 7807 | 4822 209 32852 | TDA7073A/N2 MOTOR DRIVER |
| 7871 | 4822 209 32852 | TDA7073A/N2 MOTOR DRIVER |
| 7873 | 5322 209 10421 | HEF4094BP SHIFT REGISTER |
| 7876 © | 4822 209 16143 | LC89170M CD TEXT |
| 7877 © | 4822 209 17285 | SAA7324H/M1 SIGNAL PROCESSOR |

Note: Only the parts mentioned is this list are normal service spare parts.

# COMBI BOARD

**TABLE OF CONTENTS**


Brief Introduction ..... 11-1
Features & Configuration table ..... 11-1
Main part - Component and Chip layouts ..... 11-2
Main part - Source Select & Amplifier ..... 11-3
Main part - Power Supply ..... 11-4
Transformer Primary part - Circuit & Layout ..... 11-5
Karaoke part - Circuit & Layout ..... 11-6
CDC Key & Headphone part - Circuit & Layouts ..... 11-7
Electrical parts list ..... 11-8




***Brief introduction of the Combi Board***

A. TRANSFORMER PRIMARY PART
Transformer Primary Circuit provide connection for AC mains supply and primary wires of transformer.

B. POWER SUPPLY PART
Power Supply Circuit consists of rectifiers, capacitive filters and voltage regulators. Regulated voltage include +5V6, +LED, +12A, +12M, -26V, PWDN. The +C supply to the power amplifier is not regulated. F1-F2 is the ac supply voltage to the FTD Display filament.

C. SOURCE SELECT & AMPLIFIER PART

a) SHIFT REGISTER (AF CONTROL)
This shift register deliver commands from the μP to control the AF functions which include source selection (A0 & A1 control lines), DSC modes , DBB, IS and CD_STBY. Other control lines such as MUTE, AMPON, STBY and PWM are coming directly from the μP on the Front board.

b) SOURCE SELECTION
One of the 4 sources, namely AUX, TAPE, TUNER, CD, can be selected via A0 & A1 lines which control the IC 7501 (HEF4052BT). Karaoke mic. mixing is connected to th e selected source before the signal is amplified with a buffer amplifier (Tr 7503 & 7504). The source signal is then split into recording path (for recording on tape) and main signal path (to the PWM volume control).

c) PWM VOLUME CONTROL
The discrete volume control makes use of 4 Transistors 7505, 7506, 7507 & 7508 (ON4986 or selected BC557B) and PWM control signal from μP. For good performance transistors for the left and right channels should be paired for gain characteristics.

d) SOUND FEATURES
Sound Features include the DBB, IS and 4 DSC modes. The sound features are realised with a hex-inverter IC 7530 (HEF4069UBT) as analog buffer/amplifier and transistors as electronic switches controlled by the shift registers (AF control).

e) POWER AMPLIFIER
IC 7391 (AN7125) is used as power amplifier.

f) CD_STBY CONTROL
This Transistor 7401 (BC337-25) switches on the supply +CD supply (derived from +12A) to CD servo control, HF circuit and the laser light pen on the CD Module during the CD mode only.

g) MATRIX SURROUND OUTPUT
The matrix surround feature is provided on board. This feature is only optional on certain type version.

D. KARAOKE PART
This simple Karaoke consists of a 1-mic. mono amplifier using discrete components. It has a level control using a rotary potmeter. This feature is available for some version only.

E. HEADPHONE PART
The headphone output is derived from the power amplifier output after the attenuation resistors which are tailored to deliver 18mW output power into a 32 ohm headphone.

F. CDC KEY PART
The CDC key buttons and LEDs are provided on this board.



**Combi Board application**

| | |
|---|---|
| A262 | FW-C3/37, FW-C35/37 |
| A263 | FW-C30/37 |
| A264 | FW-C30/21/21M |
| A265 | FW-C30/30 |
| A266 | FW-C38/21/21M |
| A267 | FW-C39/30 |
| A268 | FW-C39/33 |
| A269 | FW-C28/33 |
| A270 | FW-C38/22/34 |
| A271 | FW-C28/22/34 |
| A278 | FW-C38/37 |
| A279 | FW-C39/21/21M |
| A343 | FW-V39/21K/21M |
| A347 | FW-C28/21M |
| A351 | FW-V28/21M |

| **Features/Configuration:** | A262 | A263 | A264 | A265 | A266 | A267 | A268 | A269 | A270 | A271 | A278 | A279 | A343 | A347 | A351 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aux In | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Sub-woofer Out | x | x | x | x | x | x | x | - | x | - | x | x | x | - | - |
| Digital Out | - | - | - | - | x | x | x | - | x | - | x | x | - | - | - |
| Video Output | - | - | - | - | - | - | - | - | - | - | - | - | x | - | x |
| I.S. | - | - | - | - | x | x | x | - | x | - | x | x | x | - | - |
| Voltage Selector | - | - | x | - | x | - | - | - | - | - | - | x | x | x | x |
| Karaoke | - | - | x | - | x | - | x | x | - | - | - | - | x | - | x |
| DBB | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| DSC | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Matrix Surroud | - | x | - | - | x | x | x | - | - | - | x | x | x | - | - |
| 1-band Spect. Analyser | x | x | x | x | - | - | - | x | - | x | - | - | - | x | x |
| 3-band Spect. Analyser | - | - | - | - | x | x | x | - | x | - | x | x | x | - | - |
| 12W | - | - | - | - | - | - | x | - | x | - | - | - | x | x | x |
| 25W | x | x | x | x | x | x | x | - | x | - | x | x | x | - | - |
| VCD | - | - | - | - | - | - | - | - | - | - | - | - | x | - | x |
| NTC | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ECO-MTF | x | x | x | x | - | - | - | - | - | - | - | - | - | - | - |
| ETF7 | - | - | - | - | x | x | x | x | x | x | x | x | x | x | x |

## MAIN PART - COMPONENT LAYOUT

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.
CAUTION!
FOR CONTINUED PROTECTION AGAINST RISK OF FIRE REPLACE WITH SAME TYPE: TR 5, SLOW BLOW, 125V MIN. FUSE.
REFER REPLACEMENT TO QUALIFIED SERVICE PERSONNEL
ATTENTION:
POUR PROTECTION CONTRE INCENDIE, REMPLACEZ LE FUSIBLE SEULEMENT PAR LE MEME TYPE:FUSIBLE TR 5,LENT,125V MIN.
MPEG SUPPLY
AUDIO BOARD
POWER AMP BRIDGE
FRONT SUPPLY + CONTROL
COMBI CONTROL
POWER DOWN
TUNER
MIC IN
NEW VOLUME CONTROL
MICROPHONE AMP
PRE-BUFFER AMP
MPEG
PHILIPS
mgs1pang/mentor/fw-C35cb_30w/3139_113_34111_01/8239_210_86410
8239_210_86410





## MAIN PART - CHIP LAYOUT

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.
8239_210_86410

11-3

# CIRCUIT DIAGRAM - SOURCE SELECT & AMPLIFIER PART


26 E2 51 D2 55 B5 56 C15 65 A15 1322-A H14 1322-B G14 1323-A H15 1323-B H15 1323-C H15 1323-D G15 1325 F15 1507 A1 1508 F1 1509 F1 1510 D2

1511 F1 1512 C1 1517 B1 1518 A1 1519 H8 1562 B15 2249 B15 2322 D12 2323 C12 2324 C12 2327 B12 2328 D12 2329 B13 2330 C13 2331 A13

2332 D13 2333 B14 2334 D14 2335 B15 2336 D14 2337 G9 2338 H9 2339 B11 2340 E15 2341 E15 2342 G8 2343 G10 2344 H10 2345 G13 2346 H13 2347 G13

2348 H13 2349 G13 2350 H13 2351 H15 2352 G15 2353 F10 2354 F11 2355 F12 2356 E14 2357 C14 2358 G13 2359 H13 2360 A14 2361 B2 2362 G10 2363 H5

2364 F12 2365 E13 2366 F15 2370 F13 2400 H4 2404 D7 2405 D10 2506 H2 2507 F5 2508 F4 2509 D4 2510 F5 2511 E5 2512 F5 2513 E5 2514 E6 2515 B6

2500 C10 2501 B5 2502 D5 2503 F8 2519 C8 2520 C6 2521 C6 2522 D7 2523 C7 2524 D7 2525 B6 2526 E10 2527 A10 2528 E9 2529 A10 2530 G4 2531 E4

2516 A4 2517 A12 2518 C8 2519 C8 2520 C6 2521 C6 2522 D7 2523 C7 2524 D7 2525 B6 2526 E10 2527 A10 2528 E9 2529 A10 2530 G4 2531 E4

2532 E8 2533 A8 2534 D8 2535 B8 2536 F5 2537 A10 2538 E9 2539 C7 2540 C7 2541 A10 2542 E9 2543 C10 2544 C1 2545 A9 2546 E9 2547 A12

2548 C1 2549 C10 2550 C10 2551 B4 2552 C4 2553 B3 2554 B2 2555 C3 2556 D3 2557 D2 2558 D3 2559 A6 2560 D6 2561 H5 2563 E2 2564 A2

2565 A2 2566 A1 2567 A6 2568 G1 2569 G2 2570 A13 2571 A13 2572 A2 2573 A2 2574 A2 2575 B10 2576 D9 2577 F6 2578 A5 2579 D4 2580 E7

2581 H2 2582 C8 2583 C8 2584 E10 2585 A10 2586 F9 2587 A8 2588 F6 2589 E3 2590 C1 2591 E6 2592 F5 2593 A9 2594 E9 2595 B5 2596 C5

2597 F14 2598 E3 2599 F7 2600 H9 3201 D4 3321 C11 3322 C11 3325 B12 3326 D12 3329 B12 3330 D11 3331 B13 3332 C13 3333 B13 3334 D13 3335 B13

3336 D13 3337 B14 3338 D14 3339 B14 3340 D14 3341 B14 3342 C14 3343 G10 3344 H10 3346 H10 3347 G12 3348 H12 3349 G12 3350 H12 3351 G12

3352 H12 3353 F12 3354 H12 3356 G14 3357 H14 3358 G14 3359 H14 3360 H14 3361 F11 3362 F11 3364 E12 3365 G12 3366 G12 3367 G13 3368 G13

3369 G14 3370 F14 3371 F14 3372 C13 3373 F11 3400 G4 3401 G3 3402 G3 3403 G3 3404 G3 3406 G3 3407 G2 3409 G2 3410 G1 3411 F8 3412 F8 3413 F8 3414 H5 3415 H6

3388 H5 3390 H4 3400 G4 3401 G3 3402 G3 3403 G3 3404 G3 3406 G3 3407 G2 3409 G2 3410 G1 3411 F8 3412 F8 3413 F8 3414 H5 3415 H6

3488 H6 3489 H7 3490 H7 3491 H8 3492 H6 3493 H7 3494 H7 3495 H8 3496 G7 3497 G7 3498 G8 3499 G8 3501 D6 3502 G6 3503 C8 3504 C8

3507 C7 3508 C7 3509 B7 3510 D7 3511 C9 3512 C9 3513 A5 3518 D8 3519 B8 3520 A3 3521 A6 3522 D8 3523 B8 3524 E7 3525 A8 3526 E8

3527 A8 3528 D8 3529 B8 3530 E9 3531 A9 3532 C9 3533 C9 3534 E10 3535 A10 3536 E9 3537 A9 3538 E8 3539 A9 3540 F8 3541 A8 3542 H2

3543 A8 3544 E8 3545 A11 3546 D11 3547 A10 3548 E10 3549 A12 3550 D10 3551 E5 3552 G5 3553 E4 3554 F4 3555 B10 3556 A6 3557 A5 3558 C5

3559 A5 3560 C5 3561 B4 3562 A3 3563 A3 3564 D5 3565 B5 3566 B3 3567 B3 3568 C4 3569 B4 3570 C3 3571 C3 3574 D3 3575 D3 3576 D3

3577 D3 3579 H4 3580 E4 3581 E4 3582 F3 3583 F4 3584 F6 3585 F6 3586 F5 3587 F5 3605 B7 3606 D7 3609 B6 3610 D6 3611 B9 3616 E14 3617 G9

3592 D9 3593 A2

3594 A2 3596 G5 3597 E5 3598 D5 3599 B5 3601 A3 3602 A3 3603 A8 3604 E8 3605 B7 3606 D7 3609 B6 3610 D6 3611 B9 3616 E14 3617 G9

3618 H9 3638 C5 3639 B5 3640 A12 4228 F8 4229 F7 4232 C5 4233 B5 4504 C11 5501 F7 5502 C13 5503 G12 5504 G12 5505 H12 5506 H12 5507 F10

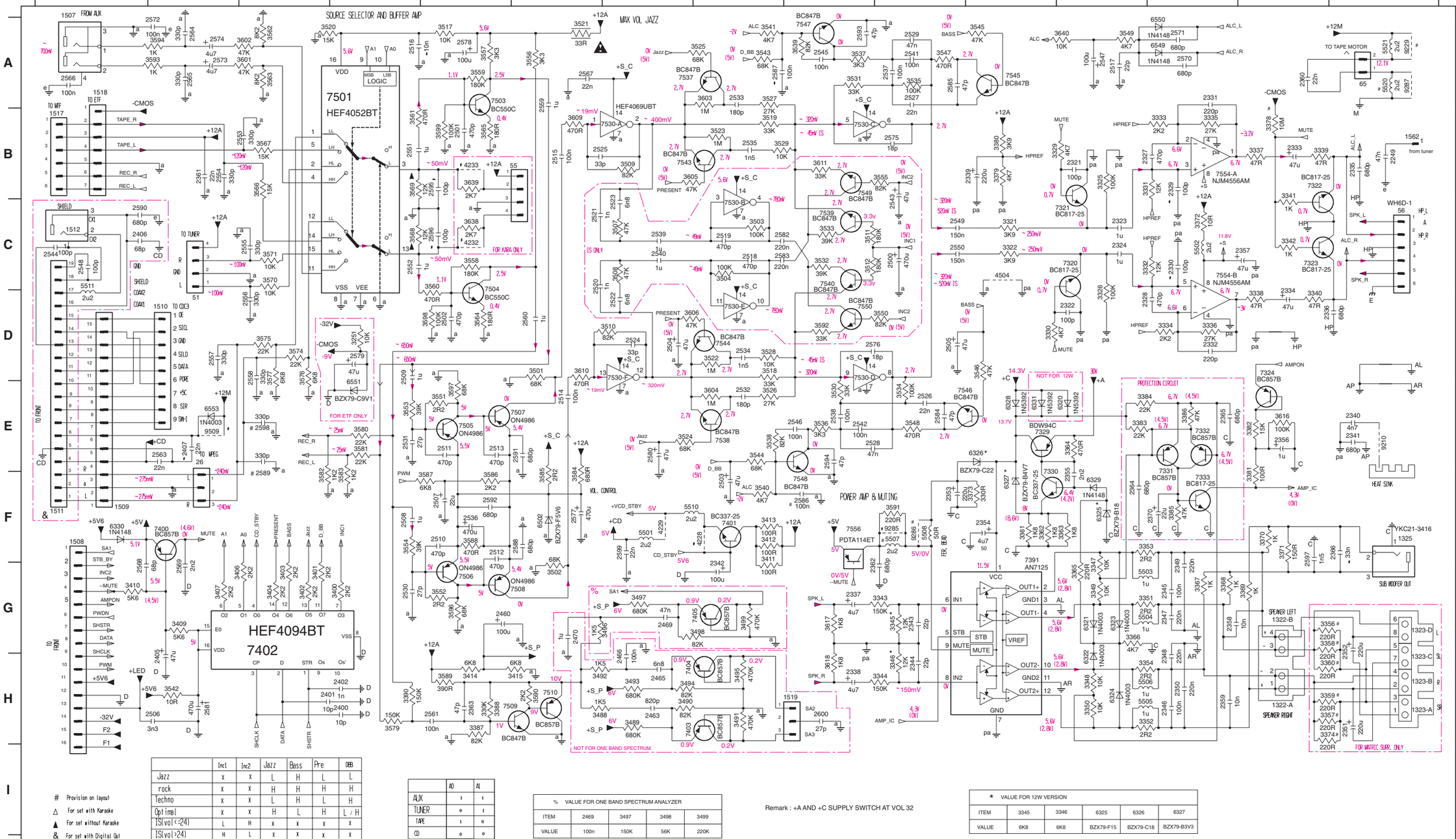
5508 F10 5510 F7 5511 C1 5520 A15 5521 A15 6322 E12 6321 G12 6322 H12 6323 G12 6324 H12 6325 F12 6326 E11 6327 F11 6328 E11 6329 F12 6330 F1

6331 E11 6502 F6 6549 A13 6550 A13 6551 E4 6553 E2 7320 C12 7321 C11 7322 B14 7323 C14 7324 D14 7329 E11 7330 E11 7331 E13 7332 E13 7333 F13

7391 F11 7400 F2 7401 F8 7402 H3 7403 H7 7404 H7 7405 G8 7501 A3 7503 A5 7504 D5 7505 E5 7506 G5 7507 E5 7508 G5 7509 H6 7510 H6

7530-A B6 7530-B C8 7530-C B9 7530-D D9 7530-E D8 7530-F D7 7537 A8 7538 E8 7539 C9 7540 C9 7543 B7 7544 D8 7545 A11 7546 E11 7547 A9 7548 F9

7549 B9 7550 D9 7554-A B13 7554-B C13 7556 F9 9210 E15 9229 A15 9285 F10 9286 F10 9287 A15 9509 E2


| | Inc1 | Inc2 | Jazz | Bass | Pre | DBB |
|---|---|---|---|---|---|---|
| Jazz | x | x | L | H | L | L |
| rock | x | x | H | H | H | H |
| Techno | x | x | L | H | L | H |
| Optimal | x | x | H | L | H | L / H |
| IS(vol<-24) | L | H | x | x | x | x |
| IS(vol>24) | H | L | x | x | x | x |

# Provision on layout
△ For set with Karaoke
▲ For set without Karaoke
& For set with Digital Out

| | A0 | A1 |
|---|---|---|
| AUX | 1 | 1 |
| TUNER | 0 | 1 |
| TAPE | 1 | 0 |
| CD | 0 | 0 |

% VALUE FOR ONE BAND SPECTRUM ANALYZER

| ITEM | 2469 | 3497 | 3498 | 3499 |
|---|---|---|---|---|
| VALUE | 100n | 150K | 56K | 220K |

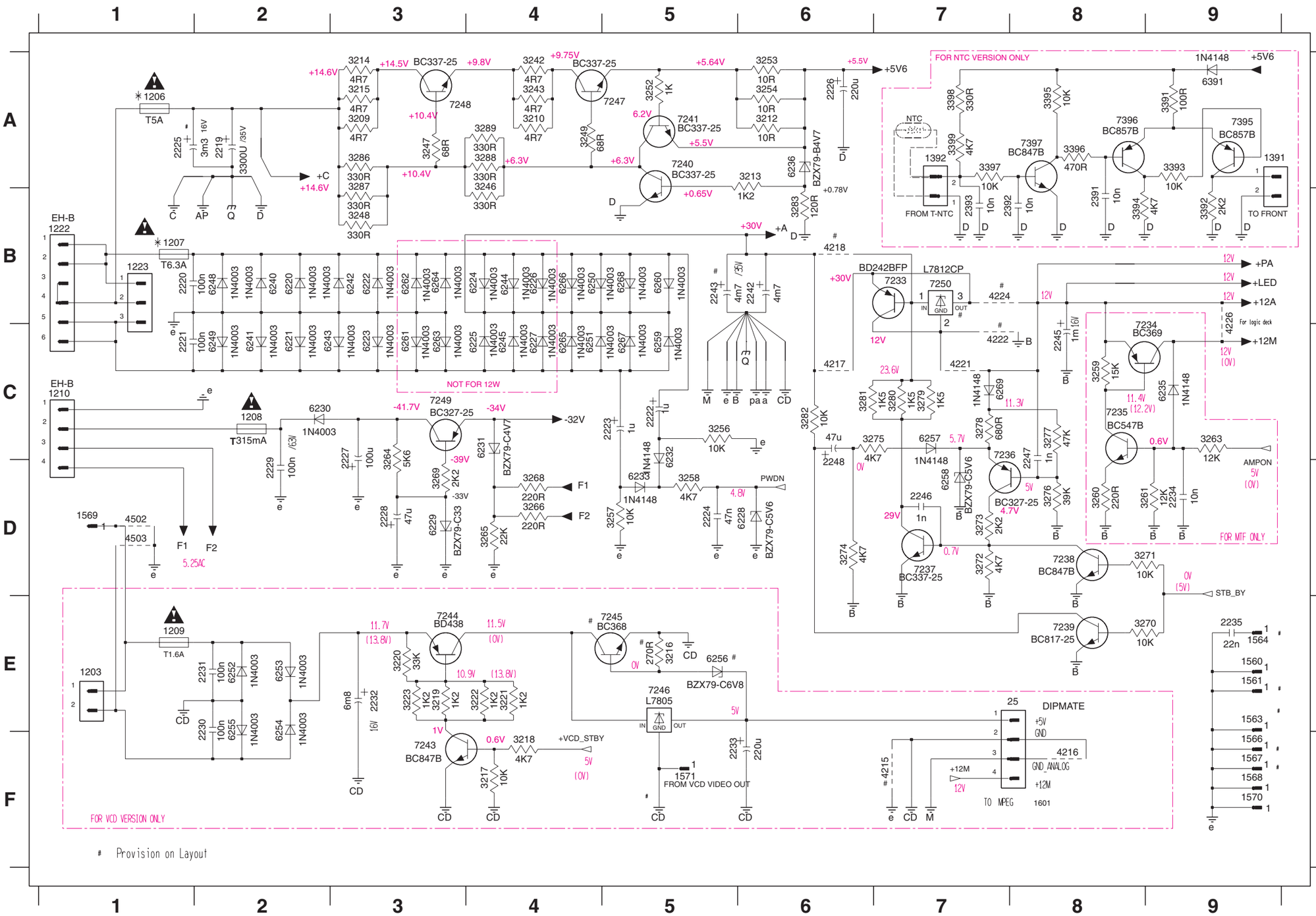
Remark : +A AND +C SUPPLY SWITCH AT VOL 32

* VALUE FOR 12W VERSION

| ITEM | 3345 | 3346 | 6325 | 6326 | 6327 |
|---|---|---|---|---|---|
| VALUE | 6K8 | 6K8 | BZX79-F15 | BZX79-C18 | BZX79-B3V3 |

11-4

# CIRCUIT DIAGRAM - POWER SUPPLY PART



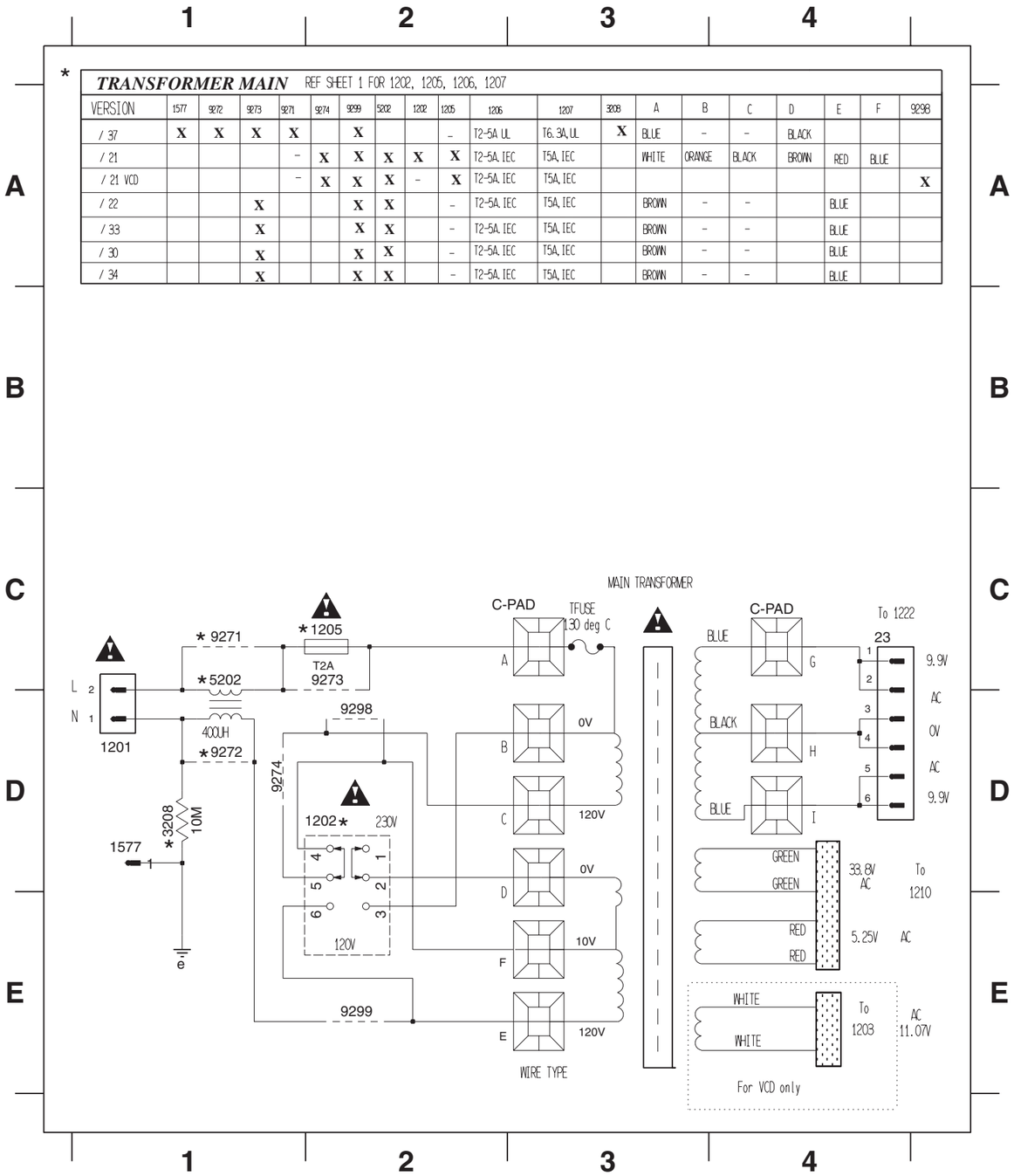

| | | |
|---|---|---|
| 25 E7 | 3261 D9 | 6257 C7 |
| 1203 E1 | 3263 C9 | 6258 D7 |
| 1206 A1 | 3264 C3 | 6259 C5 |
| 1207 B1 | 3265 D4 | 6260 B5 |
| 1208 C2 | 3266 D4 | 6261 C3 |
| 1209 E1 | 3268 D4 | 6262 B3 |
| 1210 C1 | 3269 D3 | 6263 C3 |
| 1222 B1 | 3270 E8 | 6264 B3 |
| 1223 B1 | 3271 D8 | 6265 C4 |
| 1391 A9 | 3272 D7 | 6266 B4 |
| 1392 A7 | 3273 D7 | 6267 C5 |
| 1560 E9 | 3274 D6 | 6268 B5 |
| 1561 E9 | 3275 C6 | 6269 C7 |
| 1563 E9 | 3276 D8 | 6391 A9 |
| 1564 E9 | 3277 C8 | 7233 B7 |
| 1566 F9 | 3278 C7 | 7234 B8 |
| 1567 F9 | 3279 C7 | 7235 C8 |
| 1568 F9 | 3280 C7 | 7236 C7 |
| 1569 D1 | 3281 C6 | 7237 D7 |
| 1570 F9 | 3282 C6 | 7238 D8 |
| 1571 F5 | 3283 B6 | 7239 E8 |
| 2219 A2 | 3286 A3 | 7240 A5 |
| 2220 B1 | 3287 B3 | 7241 A5 |
| 2221 C1 | 3288 A4 | 7243 F3 |
| 2222 C5 | 3289 A4 | 7244 E3 |
| 2223 C5 | 3391 A9 | 7245 E4 |
| 2224 D5 | 3392 B9 | 7246 E5 |
| 2225 A1 | 3393 A9 | 7247 A5 |
| 2226 A6 | 3394 B8 | 7248 A3 |
| 2227 C3 | 3395 A8 | 7249 C3 |
| 2228 D3 | 3396 A8 | 7250 B7 |
| 2229 D2 | 3397 A7 | 7395 A9 |
| 2230 E2 | 3398 A7 | 7396 A8 |
| 2231 E2 | 3399 A7 | 7397 A8 |
| 2232 E3 | 4215 F7 | |
| 2233 F5 | 4216 F8 | |
| 2234 D9 | 4217 C6 | |
| 2235 E9 | 4218 B6 | |
| 2242 B6 | 4221 C7 | |
| 2243 B5 | 4222 C7 | |
| 2245 C8 | 4224 B7 | |
| 2246 D7 | 4226 B9 | |
| 2247 C8 | 4502 D1 | |
| 2248 C6 | 4503 D1 | |
| 2391 B8 | 6220 B2 | |
| 2392 B8 | 6221 C2 | |
| 2393 B7 | 6222 B3 | |
| 3209 A3 | 6223 C3 | |
| 3210 A4 | 6224 B4 | |
| 3212 A6 | 6225 C4 | |
| 3213 A6 | 6226 B4 | |
| 3214 A3 | 6227 C4 | |
| 3215 A3 | 6228 D5 | |
| 3216 E5 | 6229 D3 | |
| 3217 F4 | 6230 C2 | |
| 3218 F4 | 6231 C4 | |
| 3219 E3 | 6232 C5 | |
| 3220 E3 | 6233 D5 | |
| 3221 E4 | 6235 C9 | |
| 3222 E4 | 6236 A6 | |
| 3223 E3 | 6240 B2 | |
| 3242 A4 | 6241 C2 | |
| 3243 A4 | 6242 B3 | |
| 3246 B4 | 6243 C3 | |
| 3247 A3 | 6244 B4 | |
| 3248 B3 | 6245 C4 | |
| 3249 A4 | 6248 B2 | |
| 3252 A5 | 6249 C2 | |
| 3253 A6 | 6250 B4 | |
| 3254 A6 | 6251 C4 | |
| 3256 C5 | 6252 E2 | |
| 3257 D5 | 6253 E2 | |
| 3258 D5 | 6254 E2 | |
| 3259 C8 | 6255 E2 | |
| 3260 D8 | 6256 E5 | |

# CIRCUIT DIAGRAM - TRANSFORMER PRIMARY PART

**23 C4 1202 D1 1577 D1 5202 C1 9272 D1 9274 D1 9299 E2**
**1201 D1 1205 C2 3208 D1 9271 C1 9273 C2 9298 D2**

* ***TRANSFORMER MAIN*** REF SHEET 1 FOR 1202, 1205, 1206, 1207

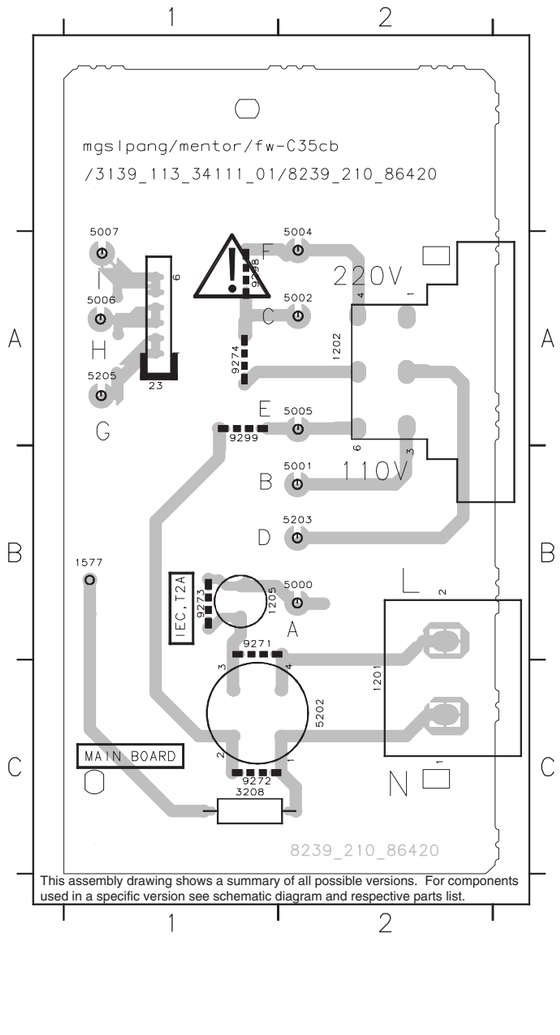
| VERSION | 1577 | 9272 | 9273 | 9271 | 9274 | 9299 | 5202 | 1202 | 1205 | 1206 | 1207 | 3208 | A | B | C | D | E | F | 9298 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| / 37 | X | X | X | X | | X | | | – | T2-5A UL | T6. 3A, UL | X | BLUE | – | – | BLACK | | | |
| / 21 | | | | – | X | X | X | X | X | T2-5A. IEC | T5A, IEC | | WHITE | ORANGE | BLACK | BROWN | RED | BLUE | |
| / 21 VCD | | | | – | X | X | X | – | X | T2-5A. IEC | T5A, IEC | | | | | | | | X |
| / 22 | | | X | | | X | X | | – | T2-5A. IEC | T5A, IEC | | BROWN | – | – | | BLUE | | |
| / 33 | | | X | | | X | X | | – | T2-5A. IEC | T5A, IEC | | BROWN | – | – | | BLUE | | |
| / 30 | | | X | | | X | X | | – | T2-5A. IEC | T5A, IEC | | BROWN | – | – | | BLUE | | |
| / 34 | | | X | | | X | X | | – | T2-5A. IEC | T5A, IEC | | BROWN | – | – | | BLUE | | |






# LAYOUT DIAGRAM - TRANSFORMER PRIMARY PART

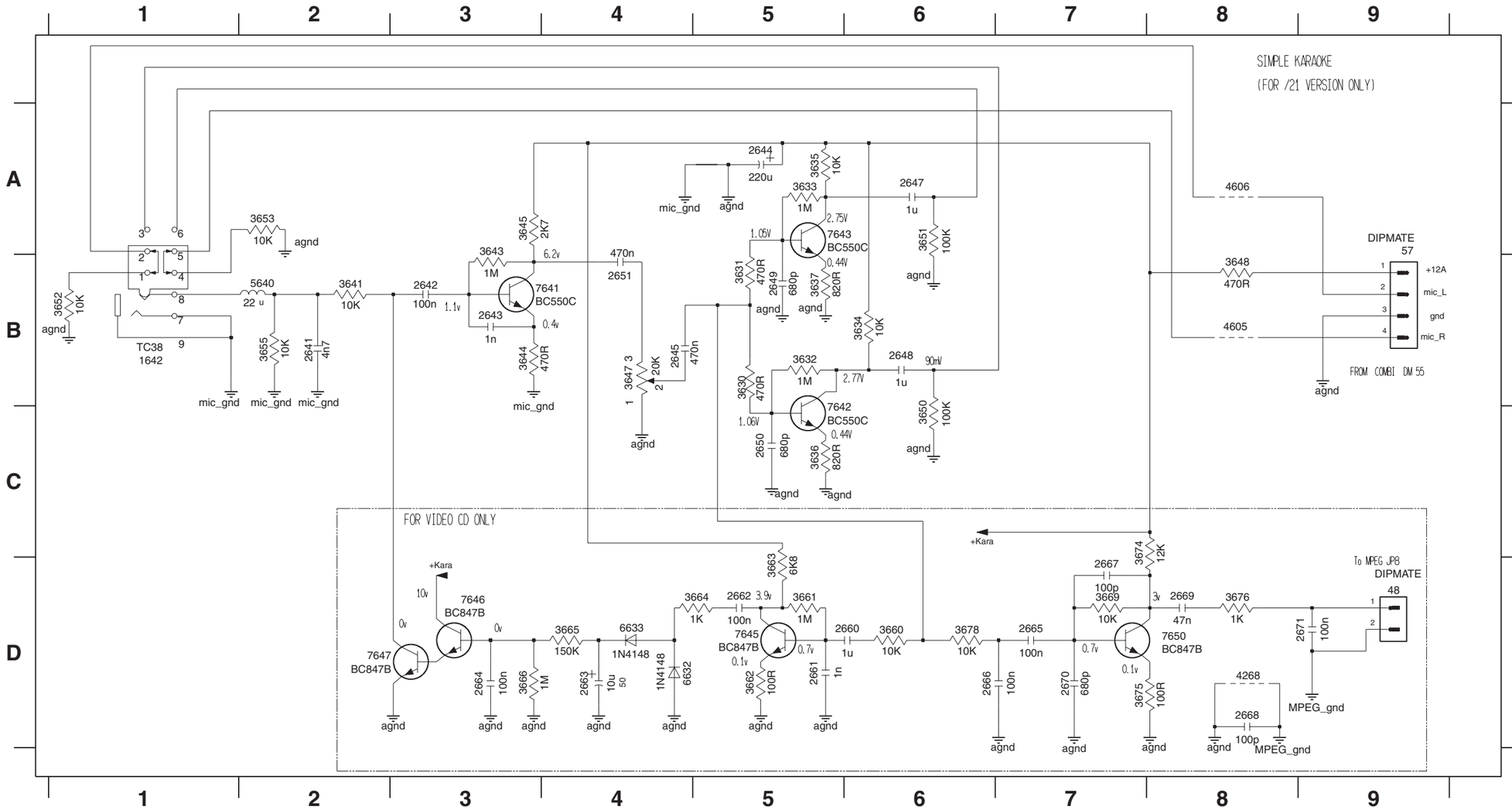
23 A1 1577 B1 5002 A2 5007 A1 9271 B1 9298 A1
1201 C2 3208 C1 5004 A2 5202 C2 9272 C1 9299 A1
1202 A2 5000 B2 5005 A2 5203 B2 9273 B1
1205 B1 5001 B2 5006 A1 5205 A1 9274 A1



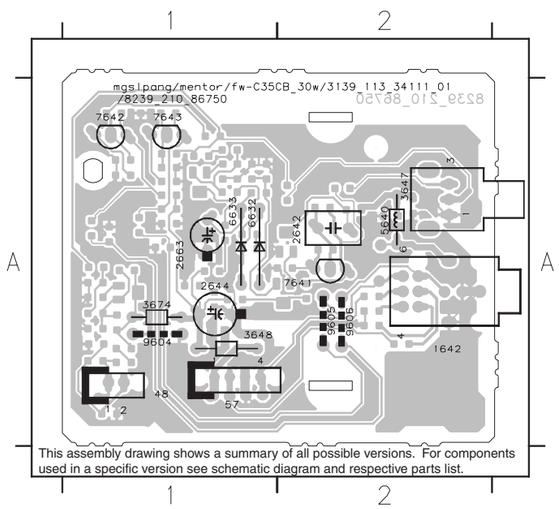

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

11-6

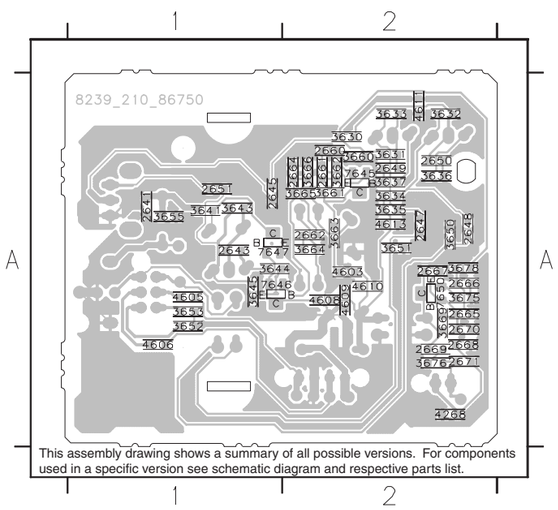
## CIRCUIT & LAYOUT DIAGRAMS - KARAOKE PART




48 D9
57 A9
1642 B1
2641 B2
2642 B3
2643 B3
2644 A5
2645 B4
2647 A6
2648 B6
2649 B5
2650 C5
2651 B4
2660 D6
2661 D5
2662 D5
2663 D4
2664 D3
2665 D7
2666 D6
2667 D7
2668 D8
2669 D8
2670 D7
2671 D9
3630 B5
3631 B5
3632 B5
3633 A5
3634 B6
3635 A5
3636 C5
3637 B5
3641 B2
3643 B3
3644 B3
3645 A3
3647 B4
3648 B8
3650 C6
3651 A6
3652 B1
3653 A2
3655 B2
3660 D6
3661 D5
3662 D5
3663 D5
3664 D5
3665 D4
3666 D3
3669 D7
3674 C7
3675 D7
3676 D8
3678 D6
4268 D8
4605 B8
4606 A8
5640 B2
6632 D4
6633 D4
7641 B3
7642 C5
7643 A5
7645 D5
7646 D3
7647 D3
7650 D8


mgslpang/mentor/fw-C35CB_30w/3139_113_34111_01
/8239_210_86750
8239_210_86750
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

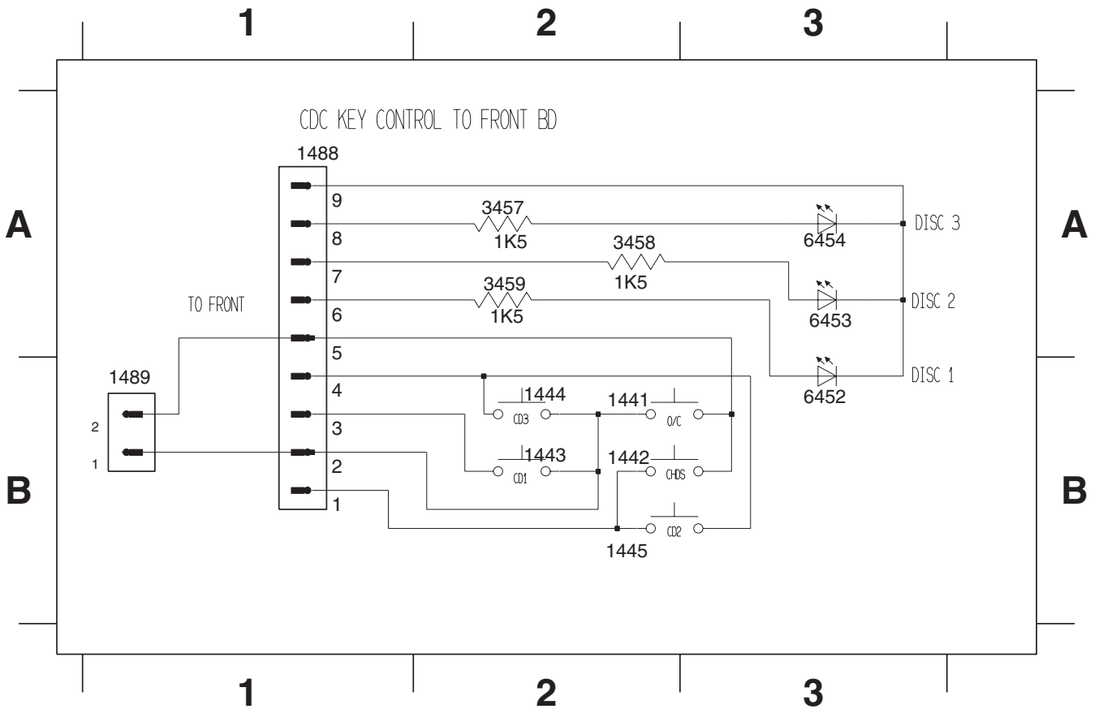
48 A1
57 A1
1642 A2
2642 A2
2644 A1
2663 A1
3647 A2
3648 A1
3674 A1
5640 A2
6632 A1
6633 A1
7641 A2
7642 A1
7643 A1
9604 A1
9605 A2
9606 A2


8239_210_86750
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

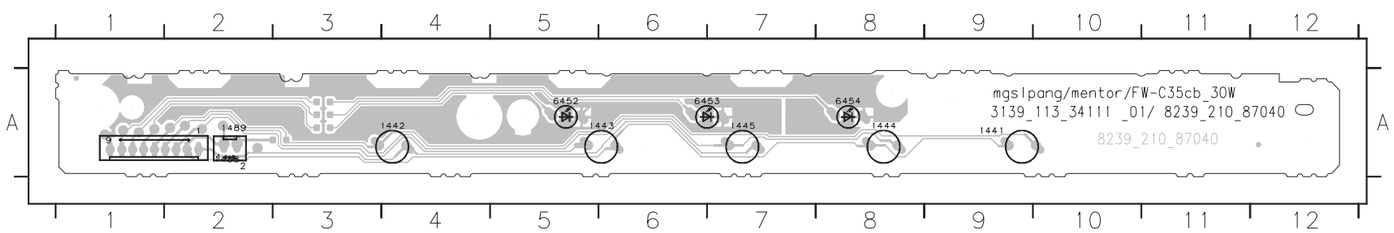
2641 A1
2643 A1
2645 A1
2647 A2
2648 A2
2649 A2
2650 A2
2651 A1
2660 A2
2661 A2
2662 A2
2664 A2
2665 A2
2666 A2
2667 A2
2668 A2
2669 A2
2670 A2
2671 A2
3630 A2
3631 A2
3632 A2
3633 A2
3634 A2
3635 A2
3636 A2
3637 A2
3641 A1
3643 A1
3644 A1
3645 A1
3650 A2
3651 A2
3652 A1
3653 A1
3655 A1
3660 A2
3661 A2
3662 A2
3663 A2
3664 A2
3665 A2
3666 A2
3669 A2
3675 A2
3676 A2
3678 A2
4268 A2
4603 A2
4605 A1
4606 A1
4608 A2
4609 A2
4610 A2
4611 A2
4613 A2
7645 A2
7646 A1
7647 A1
7650 A2

# CIRCUIT & LAYOUT DIAGRAMS - CDC KEY PART

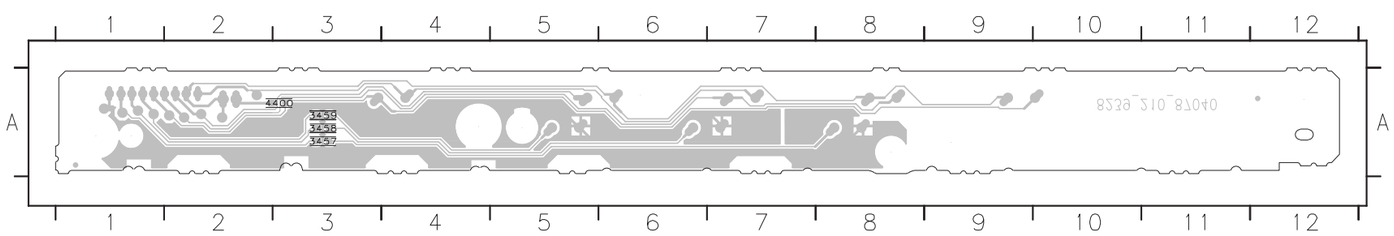
**1441 B2 1443 B2 1445 B2 1489 B1 3458 A2 6452 B3 6454 A3**
**1442 B2 1444 B2 1488 A1 3457 A2 3459 A2 6453 A3**




1441 A9 1442 A4 1443 A6 1444 A8 1445 A7 1488 A2 1489 A2 6452 A5 6453 A6 6454 A8



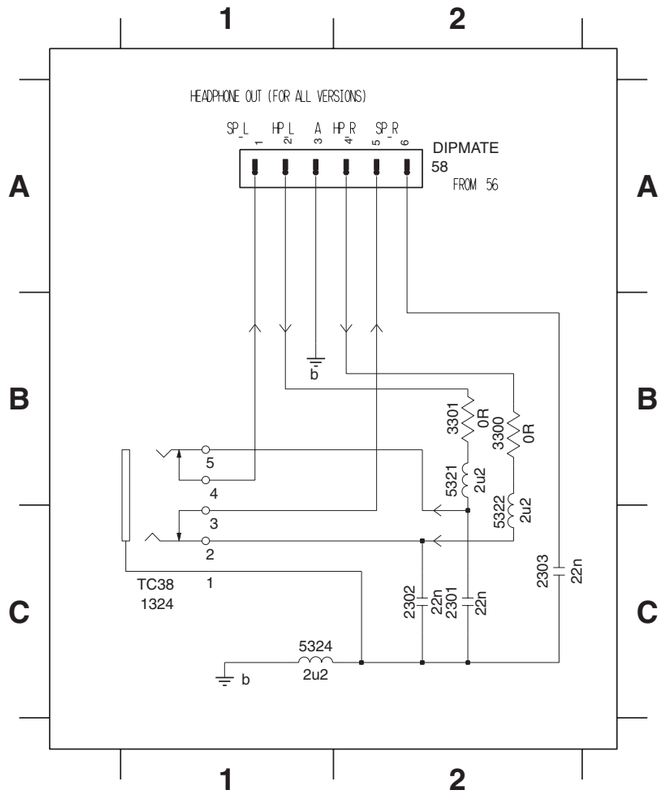

3457 A3 3458 A3 3459 A3 4400 A3



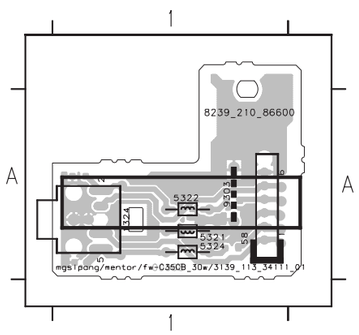



# CIRCUIT & LAYOUT DIAGRAMS - HEADPHONE PART

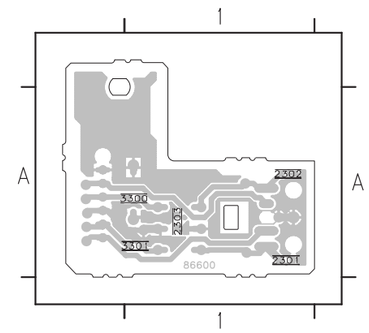
**58 A2 2301 C2 2303 C2 3301 B2 5322 C2**
**1324 C1 2302 C2 3300 B2 5321 B2 5324 C1**




58 A1 1324 A1 5321 A1 5322 A1 5324 A1 9303 A1




2301 A1 2302 A1 2303 A1 3300 A1 3301 A1



MISCELLANEOUS

| | | | |
|---|---|---|---|
| 1201 | 482226531015 | ⚠ | Mains Socket |
| 1201 | 482226531016 | ⚠ | Mains Socket /37 |
| 1202 | 482227210269 | ⚠ | Voltage Selector /21/21M |
| 1205 | 482207152002 | ⚠ | Fuse T2A 250V /21/21M/33 |
| 1206 | 482207155002 | ⚠ | Fuse T5A 250V |
| 1207 | 482207155002 | ⚠ | Fuse T5A 250V |
| 1207 | 482225251123 | ⚠ | Fuse T6,3A 250V /37 |
| 1208 | 482207153151 | ⚠ | Fuse T315mA 250V |
| 1208 | 482225251151 | ⚠ | Fuse T315mA 250V /37 |
| 1322 | 482226731176 | | Loudspeaker Socket L/R |
| 1323 | 482226510463 | | Loudspeaker Socket Matrix |
| 1324 | 482226511547 | | Headphone Socket |
| 1325 | 482226731729 | | Sub-woofer out Socket |
| 1441 | 482227613775 | | Tact Switch |
| 1442 | 482227613775 | | Tact Switch |
| 1443 | 482227613775 | | Tact Switch |
| 1444 | 482227613775 | | Tact Switch |
| 1445 | 482227613775 | | Tact Switch |
| 1507 | 482226520553 | | Aux-in Socket |
| 1508 | 242202514526 | | Flex Socket 16pin Vert, |
| 1510 | 482226511532 | | Flex Socket 9pin Vert, |
| 1511 | 482226511553 | | Flex Socket 19pin Vert, |
| 1512 | 482226731729 | | Digital out Socket |
| 1518 | 482226710953 | | Flex Socket 7pin Vert, |
| 1642 | 482226511529 | | Mic Socket Karaoke |

CAPACITORS

| | | |
|---|---|---|
| 2219 | 482212442367 | 3300µF 20% 35V |
| 2220 | 532212142386 | 100nF 5% 63V |
| 2221 | 532212142386 | 100nF 5% 63V |
| 2222 | 482212421913 | 1µF 20% 63V |
| 2223 | 482212421913 | 1µF 20% 63V |
| 2224 | 482212143526 | 47nF 5% 250V |
| 2226 | 482212480144 | 220µF 20% 25V |
| 2227 | 482212440255 | 100µF 20% 63V |
| 2228 | 482212441751 | 47µF 20% 50V |
| 2229 | 532212142386 | 100nF 5% 63V |
| 2235 | 532212232654 | 22nF 10% 63V |
| 2242 | 482212480415 | 4700µF 20% 50V |
| 2245 | 482212481144 | 1000µF 20% 16V |
| 2246 | 532212231647 | 1nF 10% 63V |
| 2247 | 532212231647 | 1nF 10% 63V |
| 2248 | 482212440433 | 47µF 20% 25V |
| 2249 | 482212143526 | 47nF 5% 250V |
| 2301 | 532212232654 | 22nF 10% 63V |
| 2302 | 532212232654 | 22nF 10% 63V |
| 2303 | 532212232654 | 22nF 10% 63V |
| 2321 | 532212232531 | 100pF 5% 50V |
| 2322 | 532212232531 | 100pF 5% 50V |
| 2323 | 482212614043 | 1µF +80/-20% 16V |
| 2324 | 482212614043 | 1µF +80/-20% 16V |
| 2327 | 532212234099 | 470pF 10% 63V |
| 2328 | 532212234099 | 470pF 10% 63V |
| 2331 | 482212233575 | 220pF 5% 63V |
| 2332 | 482212233575 | 220pF 5% 63V |
| 2333 | 482212440433 | 47µF 20% 25V |
| 2334 | 482212440433 | 47µF 20% 25V |
| 2335 | 482212232535 | 680pF 10% 63V |
| 2336 | 482212232535 | 680pF 10% 63V |
| 2337 | 482212440769 | 4,7µF 20% 100V |
| 2338 | 482212440769 | 4,7µF 20% 100V |
| 2339 | 482212480144 | 220µF 20% 25V |
| 2340 | 532212610223 | 4,7nF 10% 63V |
| 2341 | 482212232535 | 680pF 10% 63V |
| 2342 | 482212440207 | 100µF 20% 25V |
| 2343 | 532212232658 | 22pF 5% 50V |
| 2344 | 532212232658 | 22pF 5% 50V |
| 2345 | 482212614585 | 100nF 10% 50V |
| 2346 | 482212614585 | 100nF 10% 50V |
| 2347 | 482212142408 | 220nF 5% 63V |
| 2348 | 482212142408 | 220nF 5% 63V |
| 2349 | 482212142408 | 220nF 5% 63V |
| 2350 | 482212142408 | 220nF 5% 63V |
| 2351 | 482212480144 | 220µF 20% 25V |
| 2352 | 482212480144 | 220µF 20% 25V |
| 2353 | 482212480144 | 220µF 20% 25V |
| 2354 | 482212440769 | 4,7µF 20% 100V |
| 2355 | 482212233127 | 2,2nF 10% 63V |
| 2356 | 482212421913 | 1µF 20% 63V |
| 2357 | 482212440433 | 47µF 20% 25V |
| 2358 | 482212233177 | 10nF 20% 50V |
| 2359 | 482212233177 | 10nF 20% 50V |
| 2360 | 532212232654 | 22nF 10% 63V |
| 2361 | 532212232654 | 22nF 10% 63V |
| 2362 | 482212232535 | 680pF 10% 63V |
| 2363 | 482212613692 | 47pF 1% 63V |
| 2364 | 482212232535 | 680pF 10% 63V |
| 2365 | 482212232535 | 680pF 10% 63V |
| 2370 | 482212481151 | 22µF 20% 50V |
| 2400 | 532212232448 | 10pF 5% 63V |
| 2401 | 532212232448 | 10pF 5% 63V |
| 2402 | 532212231647 | 1nF 10% 63V |
| 2405 | 482212440433 | 47µF 20% 25V |
| 2406 | 482212613694 | 68pF 1% 63V |
| 2460 | 482212440207 | 100µF 20% 25V |
| 2463 | 482212233806 | 820pF 10% 63V |
| 2465 | 532212231866 | 6,8nF 10% 63V |
| 2466 | 482212613838 | 100nF +80/-20% 50V |
| 2469 | 482212613751 | 47nF 10% 63V |
| 2470 | 482212614043 | 1µF +80/-20% 16V |
| 2500 | 482212480195 | 470µF 20% 10V |
| 2501 | 532212232268 | 470pF 10% 50V |
| 2502 | 532212232268 | 470pF 10% 50V |
| 2503 | 482212440433 | 47µF 20% 25V |
| 2504 | 482212440433 | 47µF 20% 25V |
| 2505 | 482212440433 | 47µF 20% 25V |



11-8

ELECTRICAL PARTS LIST - COMBI BOARD

| | | |
|---|---|---|
| 2506 | 482212233891 | 3,3nF 10% 63V |
| 2507 | 482212481151 | 22µF 20% 50V |
| 2508 | 482212614043 | 1µF +80/-20% 16V |
| 2509 | 482212614043 | 1µF +80/-20% 16V |
| 2510 | 532212234099 | 470pF 10% 63V |
| 2511 | 532212234099 | 470pF 10% 63V |
| 2512 | 532212234099 | 470pF 10% 63V |
| 2513 | 532212234099 | 470pF 10% 63V |
| 2514 | 482212614585 | 100nF 10% 50V |
| 2515 | 482212614585 | 100nF 10% 50V |
| 2517 | 532212232658 | 22pF 5% 50V |
| 2518 | 532212234099 | 470pF 10% 63V |
| 2519 | 532212234099 | 470pF 10% 63V |
| 2520 | 532212231647 | 1nF 10% 63V |
| 2521 | 532212231647 | 1nF 10% 63V |
| 2522 | 532212231866 | 6,8nF 10% 63V |
| 2523 | 532212231866 | 6,8nF 10% 63V |
| 2524 | 532212232659 | 33pF 5% 50V |
| 2525 | 532212232659 | 33pF 5% 50V |
| 2526 | 482212141856 | 22nF 5% 250V |
| 2527 | 482212141856 | 22nF 5% 250V |
| 2528 | 482212613751 | 47nF 10% 63V |
| 2529 | 482212613751 | 47nF 10% 63V |
| 2530 | 482212613691 | 27pF 1% 63V |
| 2531 | 482212613691 | 27pF 1% 63V |
| 2532 | 482212610326 | 180pF 5% 63V |
| 2533 | 482212610326 | 180pF 5% 63V |
| 2534 | 532212231865 | 1,5nF 10% 63V |
| 2535 | 532212231865 | 1,5nF 10% 63V |
| 2536 | 482212480195 | 470µF 20% 10V |
| 2537 | 482212613838 | 100nF +80/-20% 50V |
| 2538 | 482212613838 | 100nF +80/-20% 50V |
| 2539 | 482212614043 | 1µF +80/-20% 16V |
| 2540 | 482212614043 | 1µF +80/-20% 16V |
| 2541 | 482212613838 | 100nF +80/-20% 50V |
| 2542 | 482212613838 | 100nF +80/-20% 50V |
| 2543 | 482212440433 | 47µF 20% 25V |
| 2544 | 532212232531 | 100pF 5% 50V |
| 2545 | 482212613838 | 100nF +80/-20% 50V |
| 2546 | 482212613838 | 100nF +80/-20% 50V |
| 2547 | 482212440207 | 100µF 20% 25V |
| 2548 | 532212232531 | 100pF 5% 50V |
| 2549 | 482212141854 | 150nF 5% 63V |
| 2550 | 482212141854 | 150nF 5% 63V |
| 2551 | 482212614043 | 1µF +80/-20% 16V |
| 2552 | 482212614043 | 1µF +80/-20% 16V |
| 2553 | 532212231863 | 330pF 5% 63V |
| 2554 | 532212231863 | 330pF 5% 63V |
| 2555 | 532212231863 | 330pF 5% 63V |
| 2556 | 532212231863 | 330pF 5% 63V |
| 2557 | 532212231863 | 330pF 5% 63V |
| 2558 | 532212231863 | 330pF 5% 63V |
| 2559 | 482212614043 | 1µF +80/-20% 16V |
| 2560 | 482212614043 | 1µF +80/-20% 16V |
| 2561 | 482212614585 | 100nF 10% 50V |
| 2563 | 532212232654 | 22nF 10% 63V |
| 2564 | 532212231863 | 330pF 5% 63V |
| 2565 | 532212231863 | 330pF 5% 63V |
| 2566 | 482212613838 | 100nF +80/-20% 50V |
| 2567 | 532212232654 | 22nF 10% 63V |
| 2568 | 482212613694 | 68pF 1% 63V |
| 2569 | 482212233127 | 2,2nF 10% 63V |
| 2570 | 482212232535 | 680pF 10% 63V |
| 2571 | 482212232535 | 680pF 10% 63V |
| 2572 | 482212613838 | 100nF +80/-20% 50V |
| 2573 | 482212440769 | 4,7µF 20% 100V |
| 2574 | 482212440769 | 4,7µF 20% 100V |
| 2575 | 482212613689 | 18pF 1% 63V |
| 2576 | 482212613689 | 18pF 1% 63V |
| 2577 | 482212480195 | 470µF 20% 10V |
| 2578 | 482212440207 | 100µF 20% 25V |
| 2579 | 482212440433 | 47µF 20% 25V |
| 2580 | 482212440433 | 47µF 20% 25V |
| 2581 | 482212480791 | 470µF 20% 16V |
| 2582 | 482212613561 | 220nF 10% 16V |
| 2583 | 482212613561 | 220nF 10% 16V |
| 2584 | 482212613692 | 47pF 1% 63V |
| 2585 | 482212613692 | 47pF 1% 63V |
| 2588 | 482212232535 | 680pF 10% 63V |
| 2590 | 482212232535 | 680pF 10% 63V |
| 2591 | 482212232535 | 680pF 10% 63V |
| 2592 | 482212232535 | 680pF 10% 63V |
| 2593 | 482212613692 | 47pF 1% 63V |
| 2594 | 482212613692 | 47pF 1% 63V |
| 2597 | 532212231865 | 1,5nF 10% 63V |
| 2599 | 532212232654 | 22nF 10% 63V |
| 2600 | 482212613691 | 27pF 1% 63V |
| 2641 | 532212610223 | 4,7nF 10% 63V |
| 2642 | 532212142386 | 100nF 5% 63V |
| 2643 | 532212231647 | 1nF 10% 63V |
| 2644 | 482212480144 | 220µF 20% 25V |
| 2645 | 482212613482 | 470nF +80/-20% 16V |
| 2647 | 482212614043 | 1µF +80/-20% 16V |
| 2648 | 482212614043 | 1µF +80/-20% 16V |
| 2649 | 482212232535 | 680pF 10% 63V |
| 2650 | 482212232535 | 680pF 10% 63V |
| 2651 | 482212613482 | 470nF +80/-20% 16V |

RESISTORS

| | | |
|---|---|---|
| 3208 | 482205321106 | 10M 5% 0,5W /37 only |
| 3209 | 482205120478 | 4R7 5% 0,1W |
| 3210 | 482205120478 | 4R7 5% 0,1W |
| 3212 | 482205120109 | 10R 5% 0,1W |
| 3213 | 482205120122 | 1k2 5% 0,1W |
| 3214 | 482205120478 | 4R7 5% 0,1W |
| 3215 | 482205120478 | 4R7 5% 0,1W |
| 3242 | 482205120478 | 4R7 5% 0,1W |

11-9

## ELECTRICAL PARTS LIST - COMBI BOARD

ELECTRICAL PARTS LIST - COMBI BOARD

RESISTORS

| | | |
|---|---|---|
| 3243 | 482205120478 | 4R7 5% 0,1W |
| 3246 | 482211713577 | 330R 1% 0,1W |
| 3247 | 482211712521 | 68R 1% 0,1W |
| 3248 | 482211713577 | 330R 1% 0,1W |
| 3249 | 482211712521 | 68R 1% 0,1W |
| 3251 | 482211710833 | 10k 1% 0,1W |
| 3252 | 482205110102 | 1k 2% 0,25W |
| 3253 | 482205120109 | 10R 5% 0,1W |
| 3254 | 482205120109 | 10R 5% 0,1W |
| 3256 | 482205021003 | 10k 1% 0,6W |
| 3257 | 482205021003 | 10k 1% 0,6W |
| 3258 | 482211652283 | 4k7 5% 0,5W |
| 3264 | 482211652289 | 5k6 5% 0,5W |
| 3265 | 482211652257 | 22k 5% 0,5W |
| 3266 | 482211683872 | 220R 5% 0,5W |
| 3268 | 482211683872 | 220R 5% 0,5W |
| 3269 | 482211652256 | 2k2 5% 0,5W |
| 3270 | 482211710833 | 10k 1% 0,1W |
| 3271 | 482211710833 | 10k 1% 0,1W |
| 3272 | 482205120472 | 4k7 5% 0,1W |
| 3273 | 482211711449 | 2k2 1% 0,1W |
| 3274 | 482205120472 | 4k7 5% 0,1W |
| 3275 | 482205120472 | 4k7 5% 0,1W |
| 3276 | 482205120393 | 39k 5% 0,1W |
| 3277 | 482211710834 | 47k 1% 0,1W |
| 3278 | 482211710361 | 680R 1% 0,1W |
| 3279 | 482211711139 | 1k5 1% 0,1W |
| 3280 | 482211711139 | 1k5 1% 0,1W |
| 3281 | 482211711139 | 1k5 1% 0,1W |
| 3282 | 482211710833 | 10k 1% 0,1W |
| 3283 | 482205120121 | 120R 5% 0,1W |
| 3286 | 482211713577 | 330R 1% 0,1W |
| 3287 | 482211713577 | 330R 1% 0,1W |
| 3288 | 482211713577 | 330R 1% 0,1W |
| 3289 | 482211713577 | 330R 1% 0,1W |
| 3300 | 482205120008 | 0R Jumper 0805 |
| 3301 | 482205120008 | 0R Jumper 0805 |
| 3321 | 482205120392 | 3k9 5% 0,1W |
| 3322 | 482205120392 | 3k9 5% 0,1W |
| 3325 | 482211710837 | 100k 1% 0,1W |
| 3326 | 482211710837 | 100k 1% 0,1W |
| 3329 | 482205120472 | 4k7 5% 0,1W |
| 3330 | 482205120472 | 4k7 5% 0,1W |
| 3331 | 482211711383 | 12k 1% 0,1W |
| 3332 | 482211711383 | 12k 1% 0,1W |
| 3333 | 482211711449 | 2k2 1% 0,1W |
| 3334 | 482211711449 | 2k2 1% 0,1W |
| 3335 | 482205120273 | 27k 5% 0,1W |
| 3336 | 482205120273 | 27k 5% 0,1W |
| 3337 | 482205120479 | 47R 5% 0,1W |
| 3338 | 482205120479 | 47R 5% 0,1W |
| 3339 | 482205120479 | 47R 5% 0,1W |
| 3340 | 482205120479 | 47R 5% 0,1W |
| 3341 | 482205110102 | 1k 2% 0,25W |
| 3342 | 482205110102 | 1k 2% 0,25W |
| 3343 | 482205120154 | 150k 5% 0,1W |
| 3344 | 482205120154 | 150k 5% 0,1W |
| 3345 | 482211711383 | 12k 1% 0,1W |
| 3346 | 482211711383 | 12k 1% 0,1W |
| 3347 | 482211710833 | 10k 1% 0,1W |
| 3348 | 482211710833 | 10k 1% 0,1W |
| 3349 | 482211710833 | 10k 1% 0,1W |
| 3350 | 482211710833 | 10k 1% 0,1W |
| 3351 | 482205120228 | 2R2 5% 0,1W |
| 3352 | 482205120228 | 2R2 5% 0,1W |
| 3353 | 482205120228 | 2R2 5% 0,1W |
| 3354 | 482205120228 | 2R2 5% 0,1W |
| 3361 | 482211652249 | 1k8 5% 0,5W |
| 3362 | 482211652249 | 1k8 5% 0,5W |
| 3363 | 482211652249 | 1k8 5% 0,5W |
| 3364 | 482205120471 | 470R 5% 0,1W |
| 3365 | 482211683872 | 220R 5% 0,5W |
| 3366 | 482211652283 | 4k7 5% 0,5W |
| 3367 | 482205110102 | 1k 2% 0,25W |
| 3368 | 482205110102 | 1k 2% 0,25W |
| 3369 | 482205110102 | 1k 2% 0,25W |
| 3370 | 482205110102 | 1k 2% 0,25W |
| 3371 | 482211710353 | 150R 1% 0,1W |
| 3372 | 482205120109 | 10R 5% 0,1W |
| 3373 | 482211652219 | 330R 5% 0,5W |
| 3379 | 482205120472 | 4k7 5% 0,1W |
| 3380 | 482205120392 | 3k9 5% 0,1W |
| 3381 | 482211652175 | 100R 5% 0,5W |
| 3382 | 482211683933 | 15k 1% 0,1W |
| 3383 | 482205120223 | 22k 5% 0,1W |
| 3384 | 482205120223 | 22k 5% 0,1W |
| 3385 | 482211710834 | 47k 1% 0,1W |
| 3386 | 482211710834 | 47k 1% 0,1W |
| 3387 | 482211711149 | 82k 1% 0,1W |
| 3388 | 482205120334 | 330k 5% 0,1W |
| 3390 | 482205120154 | 150k 5% 0,1W |
| 3400 | 482211711449 | 2k2 1% 0,1W |
| 3401 | 482211711449 | 2k2 1% 0,1W |
| 3402 | 482211711449 | 2k2 1% 0,1W |
| 3403 | 482211711449 | 2k2 1% 0,1W |
| 3404 | 482211711449 | 2k2 1% 0,1W |
| 3406 | 482211711449 | 2k2 1% 0,1W |
| 3407 | 482211711449 | 2k2 1% 0,1W |
| 3409 | 482205120562 | 5k6 5% 0,1W |
| 3410 | 482205120562 | 5k6 5% 0,1W |
| 3411 | 482211652175 | 100R 5% 0,5W |
| 3412 | 482211652175 | 100R 5% 0,5W |
| 3413 | 482211652175 | 100R 5% 0,5W |
| 3414 | 482211711507 | 6k8 1% 0,1W |
| 3415 | 482211711507 | 6k8 1% 0,1W |
| 3439 | 482205120124 | 120k 5% 0,1W |
| 3457 | 482211711139 | 1k5 1% 0,1W |
| 3458 | 482211711139 | 1k5 1% 0,1W |
| 3459 | 482211711139 | 1k5 1% 0,1W |
| 3488 | 482211711139 | 1k5 1% 0,1W |
| 3489 | 482205120684 | 680k 5% 0,1W |
| 3490 | 482211711149 | 82k 1% 0,1W |
| 3491 | 482205120474 | 470k 5% 0,1W |
| 3492 | 482211711139 | 1k5 1% 0,1W |
| 3493 | 482205120684 | 680k 5% 0,1W |
| 3494 | 482211711149 | 82k 1% 0,1W |
| 3495 | 482205120474 | 470k 5% 0,1W |
| 3496 | 482211711139 | 1k5 1% 0,1W |
| 3497 | 482205120684 | 680k 5% 0,1W |
| 3498 | 482211711149 | 82k 1% 0,1W |
| 3499 | 482205120474 | 470k 5% 0,1W |
| 3501 | 482205120683 | 68k 5% 0,1W |
| 3502 | 482205120683 | 68k 5% 0,1W |
| 3503 | 482211710837 | 100k 1% 0,1W |
| 3504 | 482211710837 | 100k 1% 0,1W |
| 3507 | 482211710834 | 47k 1% 0,1W |
| 3508 | 482211710834 | 47k 1% 0,1W |
| 3509 | 482211711149 | 82k 1% 0,1W |
| 3510 | 482211711149 | 82k 1% 0,1W |
| 3511 | 482205120184 | 180k 5% 0,1W |
| 3512 | 482205120184 | 180k 5% 0,1W |
| 3517 | 482211710833 | 10k 1% 0,1W |
| 3518 | 482205120333 | 33k 5% 0,1W |
| 3519 | 482205120333 | 33k 5% 0,1W |
| 3520 | 482211683933 | 15k 1% 0,1W |
| 3521 | 482205210339 | ⚠ 33R 5% 0,33W |
| 3522 | 482205120105 | 1M 5% 0,1W |
| 3523 | 482205120105 | 1M 5% 0,1W |
| 3524 | 482205120683 | 68k 5% 0,1W |
| 3525 | 482205120683 | 68k 5% 0,1W |
| 3526 | 482205120273 | 27k 5% 0,1W |
| 3527 | 482205120273 | 27k 5% 0,1W |
| 3528 | 482211710833 | 10k 1% 0,1W |
| 3529 | 482211710833 | 10k 1% 0,1W |
| 3530 | 482205120333 | 33k 5% 0,1W |
| 3531 | 482205120333 | 33k 5% 0,1W |
| 3532 | 482205120393 | 39k 5% 0,1W |
| 3533 | 482205120393 | 39k 5% 0,1W |
| 3534 | 482211710837 | 100k 1% 0,1W |
| 3535 | 482211710837 | 100k 1% 0,1W |
| 3536 | 482205120332 | 3k3 5% 0,1W |
| 3537 | 482205120332 | 3k3 5% 0,1W |
| 3538 | 482211711149 | 82k 1% 0,1W |
| 3539 | 482211711149 | 82k 1% 0,1W |
| 3540 | 482205120472 | 4k7 5% 0,1W |
| 3541 | 482205120472 | 4k7 5% 0,1W |
| 3542 | 482205120109 | 10R 5% 0,1W |
| 3543 | 482205120683 | 68k 5% 0,1W |
| 3544 | 482211652297 | 68k 5% 0,5W |
| 3545 | 482211710834 | 47k 1% 0,1W |
| 3546 | 482211710834 | 47k 1% 0,1W |
| 3547 | 482205120471 | 470R 5% 0,1W |
| 3548 | 482205120471 | 470R 5% 0,1W |
| 3549 | 482205120472 | 4k7 5% 0,1W |
| 3550 | 482211652304 | 82k 5% 0,5W |
| 3551 | 482205120228 | 2R2 5% 0,1W |
| 3552 | 482205120228 | 2R2 5% 0,1W |
| 3553 | 482205120393 | 39k 5% 0,1W |
| 3554 | 482205120393 | 39k 5% 0,1W |
| 3555 | 482211711149 | 82k 1% 0,1W |
| 3556 | 482205120332 | 3k3 5% 0,1W |
| 3557 | 482205120332 | 3k3 5% 0,1W |
| 3558 | 482205120184 | 180k 5% 0,1W |
| 3559 | 482205120184 | 180k 5% 0,1W |
| 3560 | 482205120471 | 470R 5% 0,1W |
| 3561 | 482205120471 | 470R 5% 0,1W |
| 3562 | 482205120822 | 8k2 5% 0,1W |
| 3563 | 482205120822 | 8k2 5% 0,1W |
| 3564 | 482211711448 | 180R 1% 0,1W |
| 3565 | 482211711448 | 180R 1% 0,1W |
| 3566 | 482211683933 | 15k 1% 0,1W |
| 3567 | 482211683933 | 15k 1% 0,1W |
| 3568 | 482211711383 | 12k 1% 0,1W |
| 3569 | 482211711383 | 12k 1% 0,1W |
| 3570 | 482211710833 | 10k 1% 0,1W |
| 3571 | 482211710833 | 10k 1% 0,1W |
| 3574 | 482205120223 | 22k 5% 0,1W |
| 3575 | 482205120223 | 22k 5% 0,1W |
| 3576 | 482211711507 | 6k8 1% 0,1W |
| 3577 | 482211711507 | 6k8 1% 0,1W |
| 3579 | 482205120154 | 150k 5% 0,1W |
| 3580 | 482205120223 | 22k 5% 0,1W |
| 3581 | 482205120223 | 22k 5% 0,1W |
| 3582 | 482205120122 | 1k2 5% 0,1W |
| 3583 | 482205120122 | 1k2 5% 0,1W |
| 3584 | 482211710361 | 680R 1% 0,1W |
| 3585 | 482205120228 | 2R2 5% 0,1W |
| 3586 | 482211711449 | 2k2 1% 0,1W |
| 3587 | 482211711507 | 6k8 1% 0,1W |
| 3588 | 482205120471 | 470R 5% 0,1W |
| 3589 | 482205120391 | 390R 5% 0,1W |
| 3590 | 482211711449 | 2k2 1% 0,1W |
| 3591 | 482211683872 | 220R 5% 0,5W |
| 3592 | 482205120333 | 33k 5% 0,1W |
| 3593 | 482205110102 | 1k 2% 0,25W |
| 3594 | 482205110102 | 1k 2% 0,25W |
| 3596 | 482205120683 | 68k 5% 0,1W |
| 3597 | 482205120683 | 68k 5% 0,1W |

RESISTORS

| | | |
|---|---|---|
| 3598 | 482211710837 | 100k 1% 0,1W |
| 3599 | 482211710837 | 100k 1% 0,1W |
| 3601 | 482211683884 | 47k 5% 0,5W |
| 3602 | 482211683884 | 47k 5% 0,5W |
| 3603 | 482205120105 | 1M 5% 0,1W |
| 3604 | 482205120105 | 1M 5% 0,1W |
| 3605 | 482211710834 | 47k 1% 0,1W |
| 3606 | 482211710834 | 47k 1% 0,1W |
| 3609 | 482211683883 | 470R 5% 0,5W |
| 3610 | 482211683883 | 470R 5% 0,5W |
| 3611 | 482205120333 | 33k 5% 0,1W |
| 3616 | 482211710837 | 100k 1% 0,1W |
| 3617 | 482205120182 | 1k8 5% 0,1W |
| 3618 | 482205120182 | 1k8 5% 0,1W |
| 3630 | 482205120471 | 470R 5% 0,1W |
| 3631 | 482205120471 | 470R 5% 0,1W |
| 3632 | 482205120105 | 1M 5% 0,1W |
| 3633 | 482205120105 | 1M 5% 0,1W |
| 3634 | 482211710833 | 10k 1% 0,1W |
| 3635 | 482211710833 | 10k 1% 0,1W |
| 3636 | 482211711454 | 820R 1% 0,1W |
| 3637 | 482211711454 | 820R 1% 0,1W |
| 3638 | 482211712955 | 2k7 1% 0,1W |
| 3639 | 482211712955 | 2k7 1% 0,1W |
| 3640 | 482211710833 | 10k 1% 0,1W |
| 3641 | 482211710833 | 10k 1% 0,1W |
| 3643 | 482205120105 | 1M 5% 0,1W |
| 3644 | 482205120471 | 470R 5% 0,1W |
| 3645 | 482211712955 | 2k7 1% 0,1W |
| 3647 | 482210121204 | Potm Rotary 20KA |
| 3648 | 482211683883 | 470R 5% 0,5W |
| 3650 | 482211710837 | 100k 1% 0,1W |
| 3651 | 482211710837 | 100k 1% 0,1W |
| 3652 | 482211710833 | 10k 1% 0,1W |
| 3653 | 482211710833 | 10k 1% 0,1W |
| 3655 | 482211710833 | 10k 1% 0,1W |
| 4214 | 482205120008 | 0R Jumper 0805 |
| 4215 | 482205120008 | 0R Jumper 0805 |
| 4217 | 482205120008 | 0R Jumper 0805 |
| 4221 | 482205120008 | 0R Jumper 0805 |
| 4226 | 482205120008 | 0R Jumper 0805 |
| 4229 | 482205120008 | 0R Jumper 0805 |
| 4244 | 482205120008 | 0R Jumper 0805 |
| 4269 | 482205120008 | 0R Jumper 0805 |
| 4270 | 482205120008 | 0R Jumper 0805 |
| 4271 | 482205120008 | 0R Jumper 0805 |
| 4272 | 482205120008 | 0R Jumper 0805 |
| 4273 | 482205120008 | 0R Jumper 0805 |
| 4275 | 482205120008 | 0R Jumper 0805 |
| 4276 | 482205120008 | 0R Jumper 0805 |
| 4278 | 482205120008 | 0R Jumper 0805 |
| 4279 | 482205120008 | 0R Jumper 0805 |
| 4280 | 482205120008 | 0R Jumper 0805 |
| 4288 | 482205120008 | 0R Jumper 0805 |
| 4400 | 482205120008 | 0R Jumper 0805 |
| 4502 | 482205120008 | 0R Jumper 0805 |
| 4503 | 482205120008 | 0R Jumper 0805 |
| 4504 | 482205120008 | 0R Jumper 0805 |
| 4505 | 482205120008 | 0R Jumper 0805 |
| 4506 | 482205120008 | 0R Jumper 0805 |
| 4508 | 482205120008 | 0R Jumper 0805 |
| 4509 | 482205120008 | 0R Jumper 0805 |
| 4510 | 482205120008 | 0R Jumper 0805 |
| 4511 | 482205120008 | 0R Jumper 0805 |
| 4512 | 482205120008 | 0R Jumper 0805 |
| 4514 | 482205120008 | 0R Jumper 0805 |
| 4515 | 482205120008 | 0R Jumper 0805 |
| 4516 | 482205120008 | 0R Jumper 0805 |
| 4517 | 482205120008 | 0R Jumper 0805 |
| 4518 | 482205120008 | 0R Jumper 0805 |
| 4519 | 482205120008 | 0R Jumper 0805 |
| 4520 | 482205120008 | 0R Jumper 0805 |
| 4521 | 482205120008 | 0R Jumper 0805 |
| 4522 | 482205120008 | 0R Jumper 0805 |
| 4523 | 482205120008 | 0R Jumper 0805 |
| 4524 | 482205120008 | 0R Jumper 0805 |
| 4525 | 482205120008 | 0R Jumper 0805 |
| 4526 | 482205120008 | 0R Jumper 0805 |
| 4527 | 482205120008 | 0R Jumper 0805 |
| 4528 | 482205120008 | 0R Jumper 0805 |
| 4529 | 482205120008 | 0R Jumper 0805 |
| 4530 | 482205120008 | 0R Jumper 0805 |
| 4531 | 482205120008 | 0R Jumper 0805 |
| 4532 | 482205120008 | 0R Jumper 0805 |
| 4533 | 482205120008 | 0R Jumper 0805 |
| 4534 | 482205120008 | 0R Jumper 0805 |
| 4535 | 482205120008 | 0R Jumper 0805 |
| 4536 | 482205120008 | 0R Jumper 0805 |
| 4537 | 482205120008 | 0R Jumper 0805 |
| 4538 | 482205120008 | 0R Jumper 0805 |
| 4539 | 482205120008 | 0R Jumper 0805 |
| 4540 | 482205120008 | 0R Jumper 0805 |
| 4541 | 482205120008 | 0R Jumper 0805 |
| 4542 | 482205120008 | 0R Jumper 0805 |
| 4543 | 482205120008 | 0R Jumper 0805 |
| 4544 | 482205120008 | 0R Jumper 0805 |
| 4545 | 482205120008 | 0R Jumper 0805 |
| 4546 | 482205120008 | 0R Jumper 0805 |
| 4548 | 482205120008 | 0R Jumper 0805 |
| 4550 | 482205120008 | 0R Jumper 0805 |
| 4551 | 482205120008 | 0R Jumper 0805 |
| 4552 | 482205120008 | 0R Jumper 0805 |
| 4553 | 482205120008 | 0R Jumper 0805 |
| 4554 | 482205120008 | 0R Jumper 0805 |

11-10

ELECTRICAL PARTS LIST - COMBI BOARD

| | | |
|---|---|---|
| 4555 | 482205120008 | 0R Jumper 0805 |
| 4556 | 482205120008 | 0R Jumper 0805 |
| 4558 | 482205120008 | 0R Jumper 0805 |
| 4559 | 482205120008 | 0R Jumper 0805 |
| 4560 | 482205120008 | 0R Jumper 0805 |
| 4561 | 482205120008 | 0R Jumper 0805 |
| 4562 | 482205120008 | 0R Jumper 0805 |
| 4563 | 482205120008 | 0R Jumper 0805 |
| 4564 | 482205120008 | 0R Jumper 0805 |
| 4565 | 482205120008 | 0R Jumper 0805 |
| 4566 | 482205120008 | 0R Jumper 0805 |
| 4567 | 482205120008 | 0R Jumper 0805 |
| 4568 | 482205120008 | 0R Jumper 0805 |
| 4569 | 482205120008 | 0R Jumper 0805 |
| 4570 | 482205120008 | 0R Jumper 0805 |
| 4571 | 482205120008 | 0R Jumper 0805 |
| 4573 | 482205120008 | 0R Jumper 0805 |
| 4574 | 482205120008 | 0R Jumper 0805 |
| 4575 | 482205120008 | 0R Jumper 0805 |
| 4576 | 482205120008 | 0R Jumper 0805 |
| 4577 | 482205120008 | 0R Jumper 0805 |
| 4578 | 482205120008 | 0R Jumper 0805 |
| 4579 | 482205120008 | 0R Jumper 0805 |
| 4580 | 482205120008 | 0R Jumper 0805 |
| 4581 | 482205120008 | 0R Jumper 0805 |
| 4582 | 482205120008 | 0R Jumper 0805 |
| 4583 | 482205120008 | 0R Jumper 0805 |
| 4584 | 482205120008 | 0R Jumper 0805 |
| 4585 | 482205120008 | 0R Jumper 0805 |
| 4586 | 482205120008 | 0R Jumper 0805 |
| 4587 | 482205120008 | 0R Jumper 0805 |
| 4589 | 482205120008 | 0R Jumper 0805 |
| 4590 | 482205120008 | 0R Jumper 0805 |
| 4591 | 482205120008 | 0R Jumper 0805 |
| 4592 | 482205120008 | 0R Jumper 0805 |
| 4593 | 482205120008 | 0R Jumper 0805 |
| 4594 | 482205120008 | 0R Jumper 0805 |
| 4595 | 482205120008 | 0R Jumper 0805 |
| 4596 | 482205120008 | 0R Jumper 0805 |
| 4597 | 482205120008 | 0R Jumper 0805 |
| 4598 | 482205120008 | 0R Jumper 0805 |
| 4599 | 482205120008 | 0R Jumper 0805 |
| 4603 | 482205120008 | 0R Jumper 0805 |
| 4605 | 482205120008 | 0R Jumper 0805 |
| 4606 | 482205120008 | 0R Jumper 0805 |
| 4608 | 482205120008 | 0R Jumper 0805 |
| 4609 | 482205120008 | 0R Jumper 0805 |
| 4610 | 482205120008 | 0R Jumper 0805 |
| 4611 | 482205120008 | 0R Jumper 0805 |
| 4613 | 482205120008 | 0R Jumper 0805 |
| 4677 | 482205120008 | 0R Jumper 0805 |

COILS & FILTERS

| | | |
|---|---|---|
| 5202 | 482215711832 | Mains Filter 400µH except /37 |
| 5321 | 482215762552 | Coil 2,2µH 5% |
| 5322 | 482215762552 | Coil 2,2µH 5% |
| 5324 | 482215762552 | Coil 2,2µH 5% |
| 5501 | 482215762552 | Coil 2,2µH 5% |
| 5502 | 482215762552 | Coil 2,2µH 5% |
| 5503 | 482215762255 | Coil 18,5 Turns 1µH |
| 5504 | 482215762255 | Coil 18,5 Turns 1µH |
| 5505 | 482215762255 | Coil 18,5 Turns 1µH |
| 5506 | 482215762255 | Coil 18,5 Turns 1µH |
| 5508 | 482252610704 | Fe Bead 100MHz |
| 5510 | 482215762552 | Coil 2,2µH 5% |
| 5511 | 482215762552 | Coil 2,2µH 5% |
| 5521 | 482215762552 | Coil 2,2µH 5% |
| 5640 | 482215711235 | Coil 22µH 5% |

DIODES

| | | |
|---|---|---|
| 6220 | 482213031878 | 1N4003G |
| 6221 | 482213031878 | 1N4003G |
| 6222 | 482213031878 | 1N4003G |
| 6223 | 482213031878 | 1N4003G |
| 6224 | 482213031878 | 1N4003G |
| 6225 | 482213031878 | 1N4003G |
| 6226 | 482213031878 | 1N4003G |
| 6227 | 482213031878 | 1N4003G |
| 6228 | 482213034173 | BZX79-B5V6 |
| 6229 | 482213034142 | BZX79-B33 |
| 6230 | 482213031878 | 1N4003G |
| 6231 | 482213034174 | BZX79-B4V7 |
| 6232 | 482213030621 | 1N4148 |
| 6233 | 482213030621 | 1N4148 |
| 6236 | 482213034174 | BZX79-B4V7 |
| 6240 | 482213031878 | 1N4003G |
| 6241 | 482213031878 | 1N4003G |
| 6242 | 482213031878 | 1N4003G |
| 6243 | 482213031878 | 1N4003G |
| 6244 | 482213031878 | 1N4003G |
| 6245 | 482213031878 | 1N4003G |
| 6248 | 482213031878 | 1N4003G |
| 6249 | 482213031878 | 1N4003G |
| 6250 | 482213031878 | 1N4003G |
| 6251 | 482213031878 | 1N4003G |
| 6257 | 482213030621 | 1N4148 |
| 6258 | 482213034173 | BZX79-B5V6 |
| 6259 | 482213031878 | 1N4003G |
| 6260 | 482213031878 | 1N4003G |
| 6261 | 482213031878 | 1N4003G |
| 6262 | 482213031878 | 1N4003G |
| 6263 | 482213031878 | 1N4003G |
| 6264 | 482213031878 | 1N4003G |
| 6265 | 482213031878 | 1N4003G |
| 6266 | 482213031878 | 1N4003G |

## *ELECTRICAL PARTS LIST - COMBI BOARD*

DIODES

| | | |
|---|---|---|
| 6267 | 482213031878 | 1N4003G |
| 6268 | 482213031878 | 1N4003G |
| 6269 | 482213030621 | 1N4148 |
| 6320 | 532213080686 | 1N5392 |
| 6321 | 482213031878 | 1N4003G |
| 6322 | 482213031878 | 1N4003G |
| 6323 | 482213031878 | 1N4003G |
| 6324 | 482213031878 | 1N4003G |
| 6325 | 482213031024 | BZX79-B18 |
| 6326 | 482213034441 | BZX79-B22 |
| 6327 | 482213034174 | BZX79-B4V7 |
| 6328 | 532213080686 | 1N5392 |
| 6329 | 482213030621 | 1N4148 |
| 6330 | 482213030621 | 1N4148 |
| 6331 | 532213080686 | 1N5392 |
| 6452 | 482213082978 | LTL-1CHPE |
| 6453 | 482213082978 | LTL-1CHPE |
| 6454 | 482213082978 | LTL-1CHPE |
| 6502 | 482213034173 | BZX79-B5V6 |
| 6549 | 482213030621 | 1N4148 |
| 6550 | 482213030621 | 1N4148 |
| 6551 | 482213030862 | BZX79-B9V1 |
| 6553 | 482213031878 | 1N4003G |

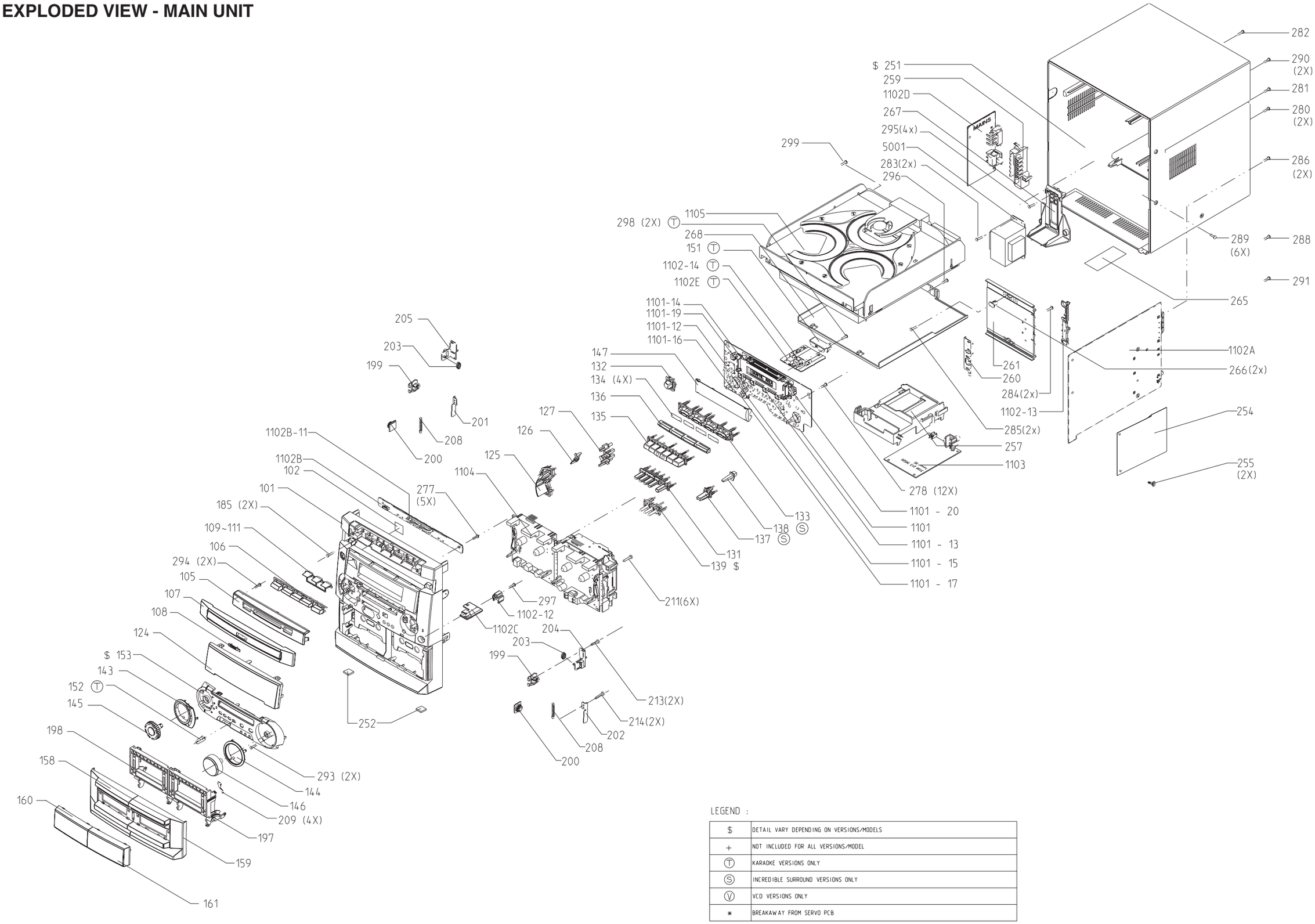
TRANSISTORS & INTEGRATED CIRCUITS

| | | |
|---|---|---|
| 7233 | 932213922687 | BD242BFP |
| 7236 | 482213041246 | BC327-25 |
| 7237 | 482213040981 | BC337-25 |
| 7238 | 482213060511 | BC847B |
| 7239 | 482213042804 | BC817-25 |
| 7240 | 482213040981 | BC337-25 |
| 7241 | 482213040981 | BC337-25 |
| 7247 | 482213040981 | BC337-25 |
| 7248 | 482213040981 | BC337-25 |
| 7249 | 482213041246 | BC327-25 |
| 7320 | 482213042804 | BC817-25 |
| 7321 | 482213042804 | BC817-25 |
| 7322 | 482213042804 | BC817-25 |
| 7323 | 482213042804 | BC817-25 |
| 7324 | 482213060373 | BC857B |
| 7329 | 482213010847 | BDW94C |
| 7330 | 482213040981 | BC337-25 |
| 7331 | 482213060373 | BC857B |
| 7332 | 482213060373 | BC857B |
| 7333 | 482213042804 | BC817-25 |
| 7391 | 482220916224 | AN7125 |
| 7400 | 482213060373 | BC857B |
| 7401 | 482213040981 | BC337-25 |
| 7402 | 532220911306 | HEF4094BT |
| 7403 | 482213060373 | BC857B |
| 7404 | 482213060373 | BC857B |
| 7405 | 482213060373 | BC857B |
| 7501 | 532220911102 | HEF4052BT |
| 7503 | 482213041096 | BC550C |
| 7504 | 482213041096 | BC550C |
| 7505 | 482213044568 | ON4986 |
| 7506 | 482213044568 | ON4986 |
| 7507 | 482213044568 | ON4986 |
| 7508 | 482213044568 | ON4986 |
| 7509 | 482213060511 | BC847B |
| 7510 | 482213060373 | BC857B |
| 7530 | 532220914482 | HEF4069UBT |
| 7537 | 482213060511 | BC847B |
| 7538 | 482213060511 | BC847B |
| 7539 | 482213060511 | BC847B |
| 7540 | 482213060511 | BC847B |
| 7543 | 482213060511 | BC847B |
| 7544 | 482213060511 | BC847B |
| 7545 | 482213060511 | BC847B |
| 7546 | 482213060511 | BC847B |
| 7547 | 482213060511 | BC847B |
| 7548 | 482213060511 | BC847B |
| 7549 | 482213060511 | BC847B |
| 7550 | 482213060511 | BC847B |
| 7554 | 482220931378 | NJM4556MB |
| 7556 | 319801044010 | PDTA114ET |
| 7641 | 482213041096 | BC550C |
| 7642 | 482213041096 | BC550C |
| 7643 | 482213041096 | BC550C |

Note: Only the parts mentioned in this list are normal service spare parts.

12-1

# EXPLODED VIEW - MAIN UNIT




LEGEND :

| | |
|---|---|
| $ | DETAIL VARY DEPENDING ON VERSIONS/MODELS |
| + | NOT INCLUDED FOR ALL VERSIONS/MODEL |
| Ⓣ | KARAOKE VERSIONS ONLY |
| Ⓢ | INCREDIBLE SURROUND VERSIONS ONLY |
| Ⓥ | VCD VERSIONS ONLY |
| * | BREAKAWAY FROM SERVO PCB |

## MECHANICAL & ACCESSORIES PARTS LIST - MAIN UNIT

| | | |
|---|---|---|
| 0101 | 313911810540 | Cabinet Front |
| 0105 | 313911810270 | Window CDC Control |
| 0106 | 313911789360 | Button Set CDC Select |
| 0107 | 313911810280 | Cover Tray CDC2 |
| 0108 | 482245413408 | Badge Philips |
| 0124 | 313911810550 | Window Display C38/21/21M |
| 0124 | 313911811020 | Window Display C38/22/34 |
| 0124 | 313911811850 | Window Display C38/37 |
| 0124 | 313911810630 | Window Display C39/21/21M |
| 0124 | 313911811320 | Window Display C39/30 |
| 0125 | 313911810920 | Button Set DBB/VEC/DSC |
| 0127 | 313911468340 | Lightguide DSC ETF |
| 0131 | 313911810590 | Button Set Progam |
| 0132 | 313911789410 | Button Power On/Off |
| 0133 | 313911469720 | Button Set Source Select, Blue |
| 0135 | 313911810760 | Button Set Controls |
| 0136 | 313911810310 | Lightcap Source Select Blue |
| 0137 | 313911810610 | Button Incredible Sound |
| 0139 | 313911468470 | Button Clock-Timer |
| 0139 | 313911468480 | Button RDS/News/Clk /22/34 |
| 0143 | 313911468410 | Cover Ring Jog ETF |
| 0144 | 313911810330 | Cover Ring Volume |
| 0145 | 313911810600 | Knob Jog Rotary 2 |
| 0146 | 313911810350 | Knob Volume Rotary |
| 0152 | 313911468030 | Knob Karaoke /21/21M |
| 0153 | 313911810580 | Cover Control IS+K /21/21M |
| 0153 | 313911810700 | Cover Control IS /30/37 |
| 0153 | 313911810720 | Cover Control IS+RDS /22/34 |
| 0158 | 313911810560 | Cover Cassette Left 2 |
| 0159 | 313911810570 | Cover Cassette Right 2 |
| 0160 | 313911468520 | Lens Cassette Left 2 |
| 0161 | 313911468530 | Lens Cassette Right 2 |
| 0197 | 482244310488 | Door Cassette Right |
| 0198 | 482244310487 | Door Cassette Left |
| 0199 | 482240210621 | Push-Catch |
| 0200 | 482252910322 | Damper Assembly |
| 0203 | 482249211344 | Spring Compression |
| 0204 | 482240211246 | Bracket Right |
| 0205 | 482240211245 | Bracket Left |
| 0208 | 482249211345 | Spring Tension |
| 0209 | 482249242787 | Spring Cassette |
| 0251 | 313911468260 | Cab. Rear MIC C38/21 |
| 0251 | 313911468590 | Cab. Rear NMI C38/21M/34 |
| 0251 | 313911468270 | Cab. Rear MIH C38/22 |
| 0251 | 313911470450 | Cab. Rear MIC C38/37 |
| 0251 | 313911468290 | Cab. Rear Mtx MIC C39/21/30 |
| 0251 | 313911468600 | Cab. Rear Mtx NMI C39/21M |
| 0252 | 482246240683 | Foot Rubber SQ |
| 0255 | 482246693148 | Spacer 5mm |
| 0260 | 482249211734 | Spring IC |
| 0266 | 313911468040 | Spacer Heatsink |
| 0349 | 313911877360 | Surround Box FW-C39 only |
| 0350 | 313911877310 | Loudspeaker Box /22/34/37 |
| 0350 | 313911877330 | Loudspeaker Box /21/21M/30 |
| 0351 | 482230350063 | FM Aerial 75R |
| 0351 | 482232011094 | FM Aerial 300R /37 |
| 0356 | 313922883620 | Remote Control RC282426/01 |
| 0384 | 482230350082 | AM Frame Aerial |
| 0385 | 482232110249 | ⚠ Mains Cord /21/21M/22/34 |
| 0385 | 482232110954 | ⚠ Mains Cord /30 |
| 0385 | 482232111466 | ⚠ Mains Cord /37 |
| 0386 | 482226321092 | ⚠ Adapter Plug 6A 250V /21 |
| 0387 | 313911619400 | Inst. For Use /21/21M/30 |
| 0387 | 313911619380 | Instruction For Use /22 |
| 0387 | 313911619390 | Instruction For Use /34 |
| 0387 | 313911619810 | Instruction For Use /37 |
| 1451 | 482232012604 | Flex Cable 9pin 22cm AD |
| 1455 | 482232012654 | Flex Cable 7pin 22cm AD |
| 1456 | 313911034180 | Flex Cable 16pin 22cm AD |
| 1557 | 482232012663 | Flex Cable 7pin 34cm BD |
| 5001 | 313911832100 | ⚠ Power Transformer /21/21M |
| 5001 | 313911832090 | ⚠ Power Transformer /22/30/34 |
| 5001 | 313911832080 | ⚠ Power Transformer /37 |

### LEFT/RIGHT LOUDSPEAKER BOX BREAKDOWN

| | |
|---|---|
| 996500002232 | Tweeter 2,5 6R 30W |
| 996500002233 | Woofer 5,25 6R 30W |
| 996500002234 | 2,2µF 50V w/Wire Assembly |
| 996500002235 | Cloth Frame Assy /21/21M/30 |
| 996500002236 | Cloth Frame Assy /22/34/37 |

### SURROUND BOX BREAKDOWN

| | |
|---|---|
| 482224010374 | Speaker 3 6R 7W |

Note: Only the parts mentioned in this list are normal service spare parts.



12-2

## SCREW LISTS - MAIN UNIT

| | |
|---|---|
| 185 | D3 x 12 |
| 211 | D3 x 12 |
| 213 | D3 x 12 |
| 214 | D3 x 12 |
| 277 | D3 x 12 |
| 278 | D3 x 12 |
| 280 | D3 x 12 |
| 281 | D3 x 12 |
| 282 | D3 x 12 |
| 283 | D3 x 16 |
| 284 | M3 x 15 |
| 285 | D3 x 16 |
| 286 | D3 x 12 |
| 288 | D3 x 12 |
| 289 | D3 x 12 |
| 290 | D3 x 12 |
| 291 | D3 x 12 |
| 293 | D3 x 12 |
| 294 | D2 x 8 |
| 295 | D3 x 16 |
| 296 | M3 x 6 |
| 297 | D3 x 12 |
| 298 | D3 x 12 |
| 299 | D3 x 12 |